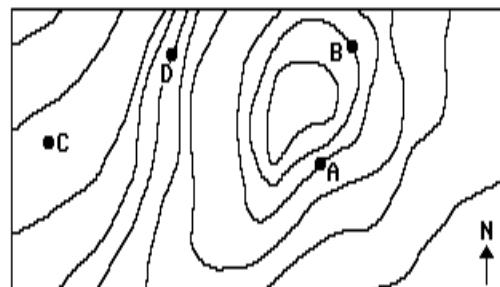


Name: _____

- 1) On a certain day, the isobars on a weather map are very close together over eastern New York State. To make the people of this area aware of possible risk to life and property in this situation, the National Weather Service should issue
- A) a dense-fog warning
 - B) an air-pollution advisory
 - C) a high-wind advisory
 - D) a heat-index warning
- 2) According to the *Earth Science Reference Tables*, a barometer reading of 29.53 inches is equal to how many millibars?
- A) 1,003.0 mb
 - B) 997.0 mb
 - C) 1,000.0 mb
 - D) 999.0 mb
- 3) A weather map of New York State shows isobars that are close together, indicating a steep pressure gradient. Which weather condition is most likely present?
- A) strong winds
 - B) dry air
 - C) low visibility
 - D) low temperatures

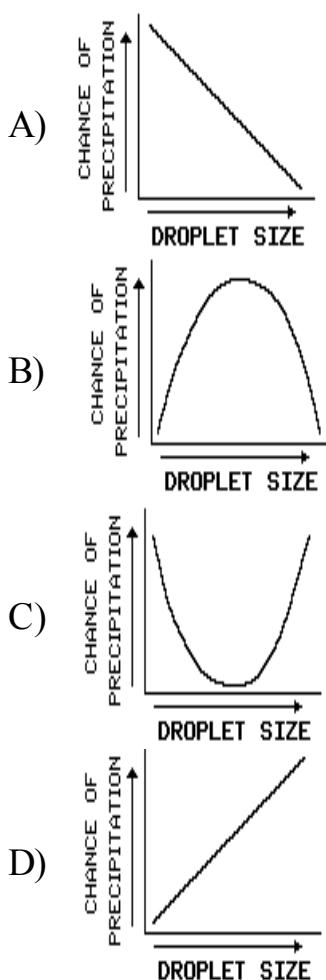
- 4) The map below represents a portion of an air-pressure field at the Earth's surface. At which position is wind speed *lowest*?



- A) A
- B) B
- C) C
- D) D

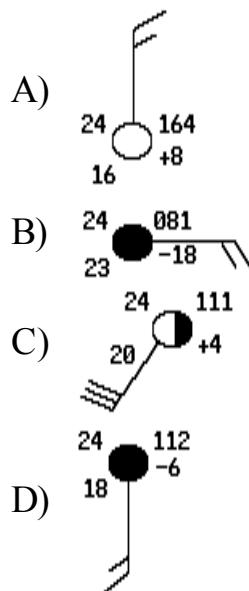
- 5) By which process does most water vapor enter the atmosphere?
- A) evaporation from lakes and rivers
 - B) evapotranspiration from land areas
 - C) sublimation from polar ice and snow
 - D) evaporation from ocean surfaces

- 6) Which graph best represents the relationship between water droplet size and the chance of precipitation?



- 7) At which temperature could water vapor in the atmosphere change directly into solid ice crystals?
 A) 20DF C) 100DC
 B) 40DF D) 10DC
- 8) When the dry-bulb temperature is 22DC and the wet-bulb temperature is 13DC, the relative humidity is
 A) 59% C) 41%
 B) 10% D) 33%

- 9) Which weather station model indicates the *greatest* probability of precipitation?

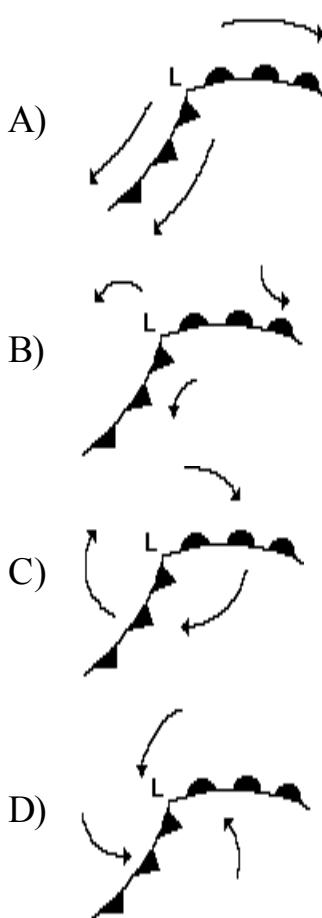


- 10) According to the *Earth Science Reference Tables*, an atmospheric pressure of 978 millibars is equal to
 A) 28.88 inches of mercury
 B) 29.00 inches of mercury
 C) 28.92 inches of mercury
 D) 28.76 inches of mercury
- 11) In which direction do surface winds around low-pressure centers in the Northern Hemisphere generally move?
 A) clockwise, toward the center of the low
 B) counterclockwise, away from the center of the low
 C) counterclockwise, toward the center of the low
 D) clockwise, away from the center of the low
- 12) A temperature of 80D Fahrenheit would be approximately equal to how many degrees on the Celsius scale?
 A) 34 C) 178
 B) 299 D) 27

- 13) Which change would result in an increase in the rate at which water evaporates from an outdoor swimming pool?
- The surface of the water is covered with white plastic.
 - Water is added to the pool each day.
 - Cloud cover decreases.
 - Wind velocity decreases.
- 14) The graph below represents how the rate of evaporation of water is affected by a variable, X . Which variable is most likely represented by X ?
-
- A) moisture content of the air
B) exposed surface area
C) temperature
D) wind velocity
- 15) Most of the Earth's surface ocean currents are caused by
- differences in ocean water density
 - the revolution of the Earth
 - stream flow from continents
 - the prevailing winds
- 16) What is the approximate dewpoint temperature if the dry-bulb temperature is 20°C and the wet-bulb temperature is 13°C? [Refer to the *Earth Science Reference Tables*.]
- 12°C
 - 7°C
 - 25°C
 - 8°C

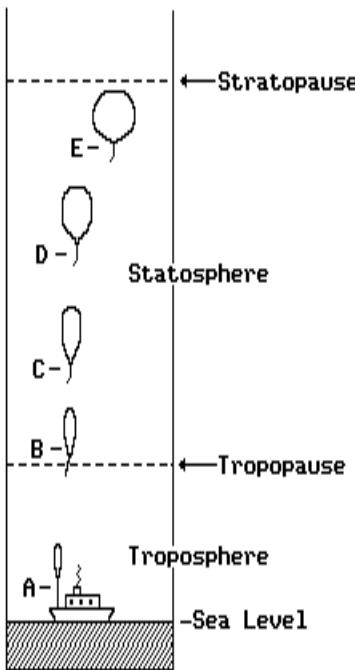
- 17) As a sample of very moist air rises from sea level to a higher altitude, the probability of condensation occurring in that air sample will
- decrease
 - increase
 - remain the same
- 18) When a strong wind is blowing from one location to another, the two locations most likely have a difference in
- elevation
 - air pressure
 - dewpoint temperature
 - cloud cover
- 19) Identify by name the surface ocean current that cools the climate of locations on the western coastline of North America.
- 20) The map below represents a section of a weather map for locations in the eastern United States. The map shows a low-pressure system, fronts, and weather stations A , B , C , and D .
-
- At which weather station are weather conditions probably most unstable?
- A
 - B
 - C
 - D

- 21) A temperature of 104°F Fahrenheit is equal to a temperature of
 A) 72°C C) 136°C
 B) 104°C D) 40°C
- 22) A cold front is moving eastward across New York State at an average speed of 50 kilometers per hour. According to the *Earth Science Reference Tables*, approximately how long will the front take to move from Buffalo to Albany?
 A) 3 hours C) 8 hours
 B) 5 hours D) 10 hours
- 23) An Earth science student observed the following weather conditions in Albany, New York, for 2 days: The first day was warm and humid with southerly winds. The second day, the temperature was 15 degrees cooler, the relative humidity had decreased, and wind direction was northwest. Which type of air mass most likely had moved into the area on the second day?
 A) maritime polar
 B) continental polar
 C) continental tropical
 D) maritime tropical
- 24) In which general direction do low-pressure centers usually travel across New York State?
 A) west to east
 B) southeast to northwest
 C) north to south
 D) northeast to southwest
- 25) Which diagram below best represents the air circulation around a Northern Hemisphere low-pressure center?



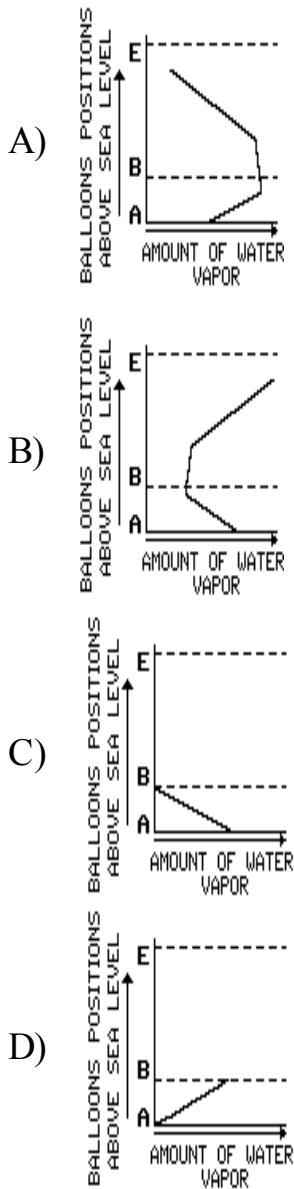
Questions 26 and 27 refer to the following:

The drawing below represents five positions of a balloon after being released from a ship. The drawings of the balloon are not to scale compared to the altitude distances, but are to scale with each other.



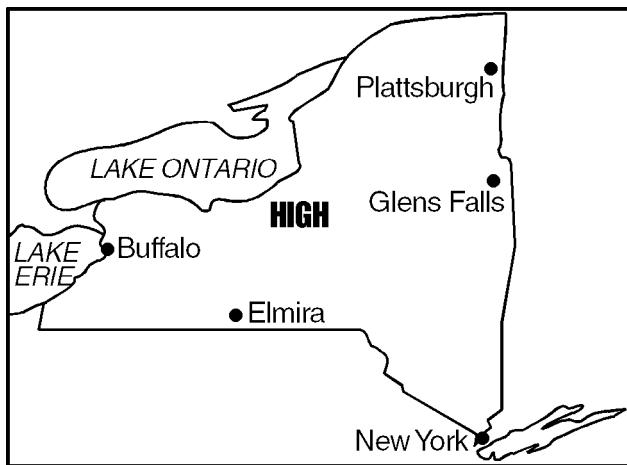
- 26) Why is the balloon's appearance at position *E* different from the balloon's appearance at position *A*?
- There is a partial vacuum inside the balloon at *A*, but not at *E*.
 - The outside air temperature is lower at *E* than at *A*.
 - There is more gas inside the balloon at *A* than at *E*.
 - The outside air pressure is lower at *E* than at *A*.

- 27) Which graph best represents the relative amounts of water vapor found in the atmosphere at different balloon positions?



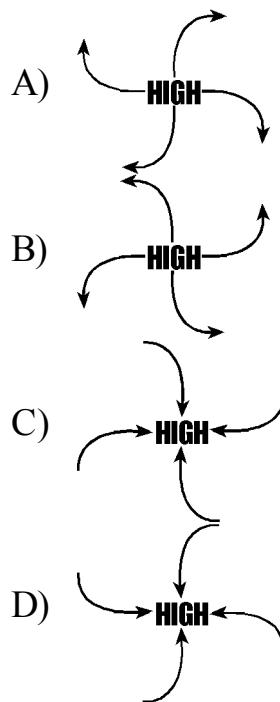
Questions 28 through 32 refer to the following:

The map below represents a high-pressure air mass centered over New York State at 10 a.m. on June 16.

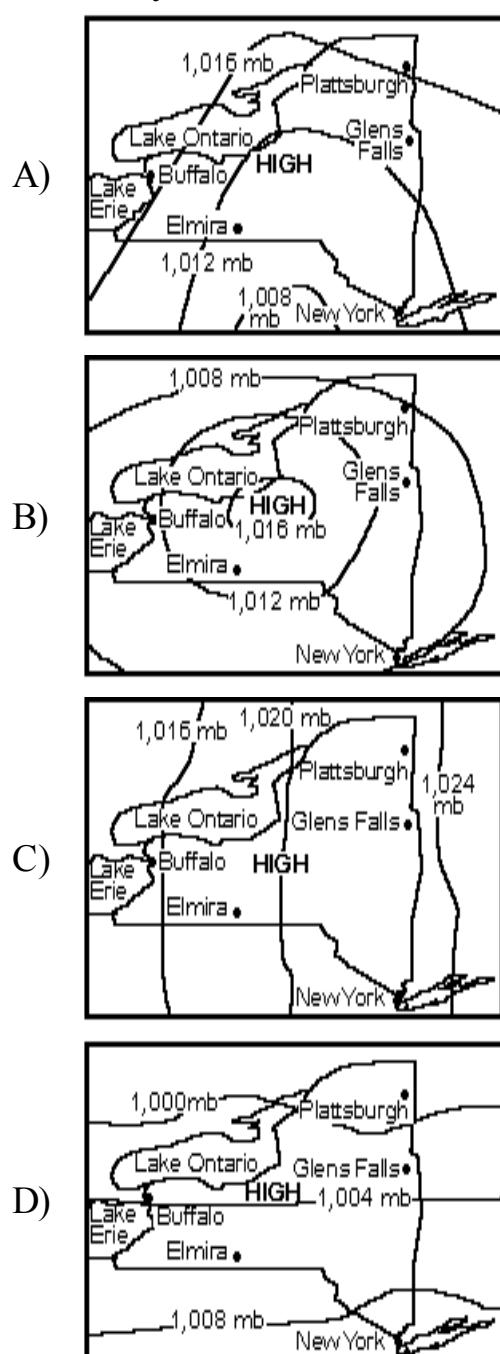


- 28) As this high-pressure center follows the usual air-mass track, it will travel toward
- Elmira
 - Buffalo
 - Lake Ontario
 - Glens Falls
- 29) Which type of air mass usually causes these high-pressure centers over New York State?
- maritime tropical
 - continental polar
 - maritime polar
 - continental tropical

- 30) Which pattern represents the most likely surface wind direction of this high-pressure system?



- 31) Which map shows the most likely pattern of isobars associated with this weather system?



- 32) At Syracuse, the weather is most likely
- clear and cool
 - hot and humid
 - cold, with snow
 - cloudy, with rain

- 33) The table below shows data for two locations in New York State.

Location	Annual Average Temperature	Latitude	Longitude
A	12°C	44°15' N	75°00' W
B	-1°C	44°15' N	74°00' W

Which factor most likely causes the difference in average annual temperature between location A and location B?

- latitude
- age of bedrock
- elevation
- number of daylight hours

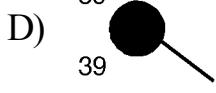
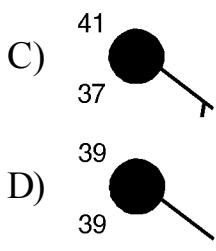
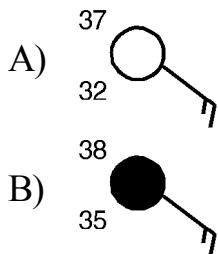
- 34) An airmass from the Gulf of Mexico, moving north into New York State, has a high relative humidity. What other characteristics will it probably have?

- cool temperatures and high pressure
- warm temperatures and low pressure
- cool temperatures and low pressure
- warm temperatures and high pressure

- 35) Which gas in the atmosphere has the most influence on day-to-day weather changes?

- ozone
- carbon dioxide
- oxygen
- water vapor

- 36) Which weather station model shows the *highest* relative humidity?



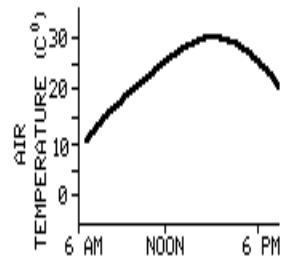
- 37) According to the *Earth Science Reference Tables*, an air pressure of 29.65 inches of mercury is equal to

- A) 1004.0 mb
- B) 999.0 mb
- C) 984.0 mb
- D) 1001.0 mb

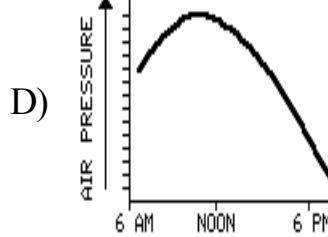
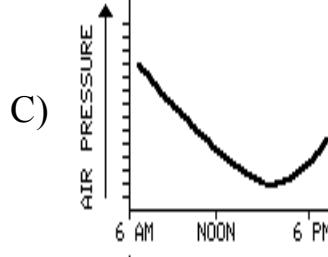
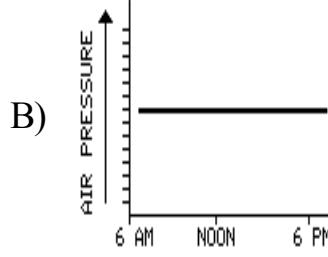
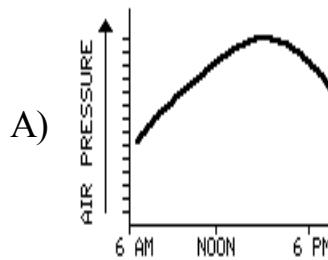
- 38) Which condition would cause surface runoff to increase in a particular location?

- A) planting grasses and shrubs on a hillside
- B) covering a dirt road with pavement
- C) having a decrease in the annual rainfall
- D) reducing the gradient of a steep hill

- 39) The graph below shows air temperature for an area near the Earth's surface during a 12-hour period.



Which graph best illustrates the probable change in air pressure during the same time period?



- 40) As a stationary airmass is heated, its density will generally

 - A) increase
 - B) remain the same
 - C) decrease

41) Most of Earth's surface ocean current patterns are primarily caused by

 - A) prevailing winds
 - B) the force of gravity
 - C) river currents
 - D) the impact of precipitation

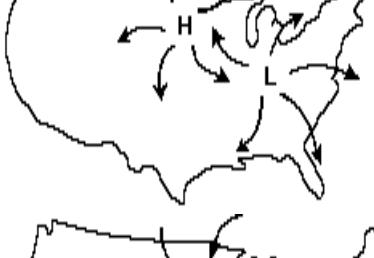
42) Water vapor enters the atmosphere by the processes of evaporation and

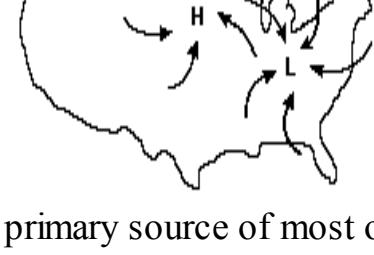
 - A) transpiration
 - B) precipitation
 - C) condensation
 - D) conduction

- 43) Which map correctly shows the wind directions of the high-pressure and low-pressure systems?

A) 

B) 

C) 

D) 

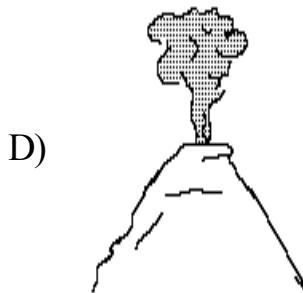
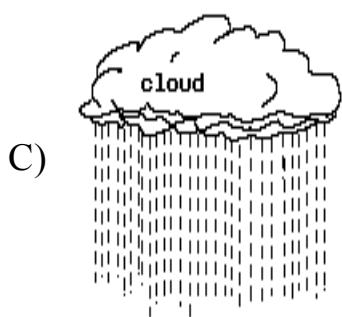
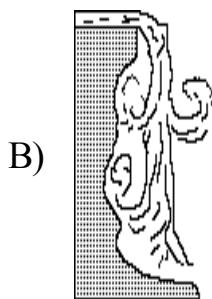
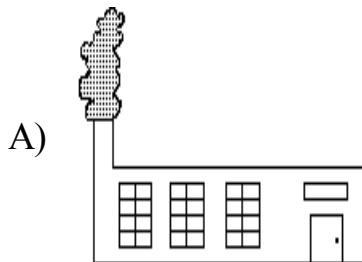
44) The primary source of most of the moisture for the Earth's atmosphere is

 - A) soil-moisture storage
 - B) melting glaciers
 - C) rivers and lakes
 - D) oceans

45) What is the approximate dewpoint temperature if the dry-bulb temperature is 26DC and the wet-bulb temperature is 20DC? [Refer to the *Earth Science Reference Tables*.]

 - A) 11DC
 - B) 20DC
 - C) 17DC
 - D) 7DC

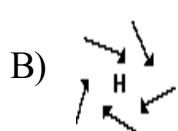
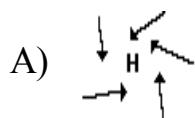
- 46) At which location will a low-pressure storm center most likely form?
- near the middle of a cold airmass
 - over a very dry, large, flat land area
 - on the leeward side of mountains
 - along a frontal surface between different airmasses
- 47) Which diagram illustrates the process that best cleans the atmosphere?



- 48) Omaha, Nebraska and Eureka, California, are both at 41° North Latitude. Omaha is a midcontinent city and Eureka is a coastal city. Why is Eureka warmer in winter and cooler in summer than Omaha?
- The angle of insolation is greater in Eureka than it is in Omaha.
 - The prevailing winds in Eureka are from the west and those in Omaha are from the east.
 - The duration of insolation in Eureka is longer in winter and shorter in summer than it is in Omaha.
 - The ocean water near Eureka is a poorer absorber and reradiator of heat than the land surface surrounding Omaha.

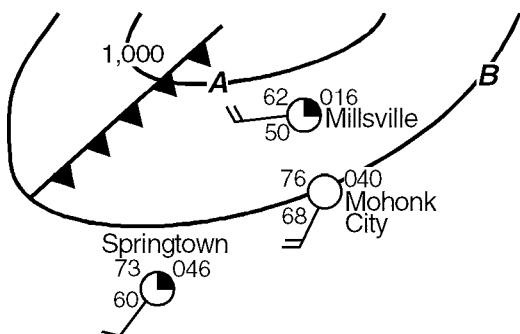
- 49) What is the general pattern of air movement on March 21 at Earth's Equator (0°)?
- downward, due to high temperature and low pressure
 - upward, due to low temperature and high pressure
 - upward, due to high temperature and low pressure
 - downward, due to low temperature and high pressure

- 50) Which diagram correctly represents the air circulation in a Northern Hemisphere high pressure airmass?



- 51) What is the *best* explanation for the two statements below?
- d Some mountains located near the Earth's Equator have snow-covered peaks.
d Icecaps exist at the Earth's poles.
- A) High elevation and high latitude have a similar effect on climate.
B) Mountain and polar regions receive more energy from the Sun than other regions do.
C) Both mountain and polar regions have arid climates.
D) An increase in snowfall and an increase in temperature have a similar effect on climate.
- 52) What is the approximate dewpoint temperature when the dry-bulb temperature is 2DC and the wet-bulb temperature is 0DC?
- A) -6DC C) -1DC
B) -2DC D) -3DC
- 53) A **mT** airmass would most likely originate over which type of Earth surface?
- A) warm and moist
B) warm and dry
C) cold and moist
D) cold and dry
- 54) How does air circulate within a cyclone (low pressure area) in the Northern Hemisphere?
- A) counterclockwise and toward the center of the cyclone
B) clockwise and toward the center of the cyclone
C) clockwise and away from the center of the cyclone
D) counterclockwise and away from the center of the cyclone
- 55) In the Northern Hemisphere, what is the direction of surface wind circulation in a low-pressure system?
- A) counterclockwise and toward the center
B) counterclockwise and outward from the center
C) clockwise and outward from the center
D) clockwise and toward the center
- 56) Which location in New York State is most likely to have the *smallest* annual temperature range?
- A) Old Forge
B) the Mohawk River Valley
C) Elmira
D) Long Island's south shore
- 57) What is the approximate dewpoint temperature if the dry-bulb temperature is 26DC and the wet-bulb temperature is 21DC? [Refer to the *Earth Science Reference Tables*.]
- A) 18DC C) 12DC
B) 23DC D) 5DC

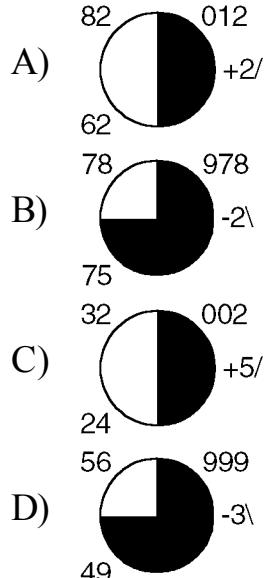
- 58) The weather map below shows a cold front approaching three cities. The two isobars are labeled *A* and *B*.



Which weather events will probably occur in Millsville as the cold front passes?

- A) an increase in clouds; a brief thunderstorm; a shift in wind direction
- B) an increase in clouds; no precipitation; no shift in wind direction
- C) a decrease in clouds; prolonged precipitation; a shift in wind direction
- D) a decrease in clouds; no precipitation; no shift in wind direction

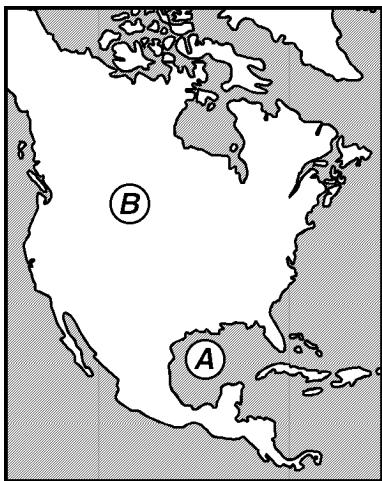
- 59) Which weather station model indicates the *highest* relative humidity?



- 60) According to the *Earth Science Reference Tables*, what is the dewpoint temperature when the dry-bulb temperature is 22DC and the wet-bulb temperature is 15DC?

- A) 12DC
- B) 14DC
- C) 7DC
- D) 10DC

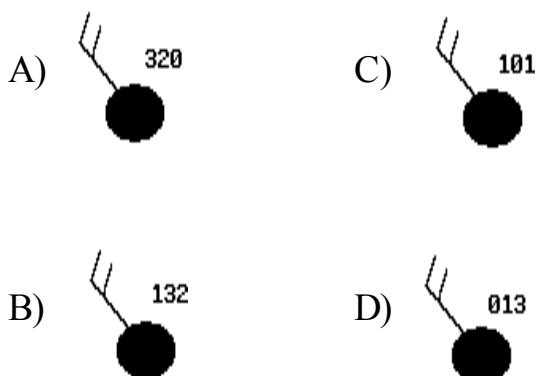
- 61) Locations *A* and *B* on the map of North America below are source regions for air masses.



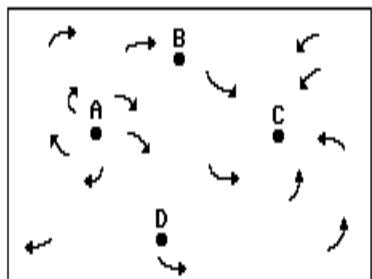
- Compared to the air mass formed at location *B*, the air mass formed at location *A* will normally be
- cooler and wetter
 - warmer and wetter
 - cooler and drier
 - warmer and drier
- 62) In New York State, dry, cool air masses (**cP**) often interact with moist, warm air masses (**mT**). Which statement correctly matches each air mass with its usual geographic source region?
- cP** is from the North Atlantic Ocean and **mT** is from the Gulf of Mexico.
 - cP** is from northern Canada and **mT** is from the Gulf of Mexico.
 - cP** is from the North Atlantic Ocean and **mT** is from the deserts of the southwestern United States.
 - cP** is from northern Canada and **mT** is from the deserts of the southwestern United States.

- 63) The rate of evaporation of water can be increased by
- decreasing the circulation of the air
 - increasing the temperature of the air
 - decreasing the temperature of the water
 - increasing the amount of moisture in the air
- 64) The primary cause of winds is the
- rotation of the Earth
 - uniform density of the atmosphere
 - friction between the atmosphere and the lithosphere
 - unequal heating of the Earth's atmosphere
- 65) Which factors have the *least* effect on the climate of a region?
- longitude and population density
 - latitude and elevation
 - wind belts and storm tracks
 - mountain barriers and nearness to large bodies of water
- 66) Why do clouds usually form at the leading edge of a cold airmass?
- Cold air contains more dust than warm air does.
 - Cold air flows over warm air, causing the warm air to descend and cool.
 - Cold air contains more water vapor than warm air does.
 - Cold air flows under warm air, causing the warm air to rise and cool.

- 67) A weather station records a barometric pressure of 1013.2 millibars. Which diagram below would best represent this weather station on a weather map?



- 68) The arrows on the diagram below represent surface wind directions on a weather map. The points represent the locations of four weather stations in the Northern Hemisphere. Which weather station probably has the *lowest* air pressure?

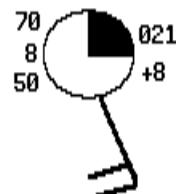


- 69) During winter, New York City frequently receives rain when locations just north and west of the city receive snow. Which statement *best* explains this difference?

- A) The ocean modifies New York City's temperatures.
 - B) New York City usually receives its weather from the south.
 - C) The snow in the clouds has been depleted by the time the storm reaches New York City.
 - D) New York City has a higher elevation.

- 70) Which substance is a form of precipitation?

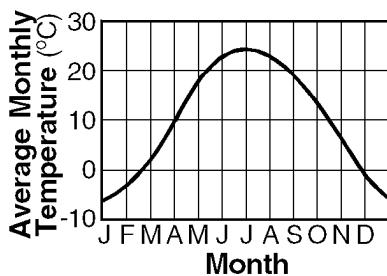
- 71) According to the *Earth Science Reference Tables*, what is the air temperature shown on the station model?



- 72) According to the *Earth Science Reference Tables*, which ocean current provides warm water that moderates the climate of South America?

- A) Benguela Current
 - B) Falkland Current
 - C) Brazil Current
 - D) Peru Current

- 73) The graph below represents the average temperature of a city for each month of the year.



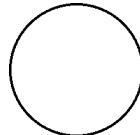
Where is this city most likely located?

- A) inland in the Northern Hemisphere, in a middle latitude
 - B) on a coast near the Equator
 - C) on a coast in the Antarctic
 - D) inland in the Southern Hemisphere, in a middle latitude
- 74) Two weather stations are located near each other. The air pressure at each station is changing so that the difference between the pressure is increasing. The wind speed between these two locations will probably
- A) remain the same
 - B) decrease
 - C) increase
- 75) Which is a form of precipitation?
- A) dew
 - B) fog
 - C) snow
 - D) frost
- 76) The rate of evaporation from the surface of a lake would be increased by
- A) a decrease in wind velocity
 - B) a decrease in the amount of insolation
 - C) an increase in the moisture content of the air
 - D) an increase in the surface area of the lake

Questions 77 through 79 refer to the following:

A student using a sling psychrometer obtained a dry-bulb reading of 20DC and a wet-bulb reading of 16DC for a parcel of air outside the classroom.

- 77) State the change in relative humidity as the air temperature and the dewpoint get closer to the same value.
- 78) State the dewpoint.
- 79) On another day, the student determined the dewpoint was 70DF. Record the dewpoint, using the proper format, in the correct location on the weather station model below.

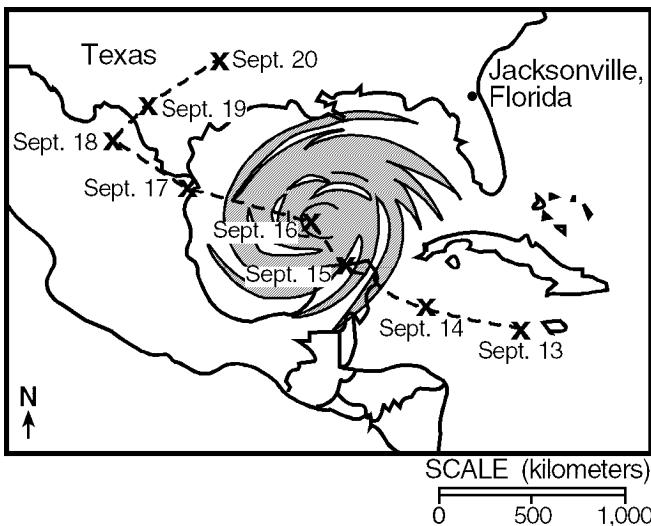


- 80) Which type of air mass usually contains the most moisture?
- A) cP
 - B) mT
 - C) mP
 - D) cT
- 81) By which process are clouds, dew, and fog formed?
- A) precipitation
 - B) condensation
 - C) evaporation
 - D) melting

- 82) A student used a sling psychrometer to measure the humidity of the air. If the relative humidity was 65% and the dry-bulb temperature was 10DC, what was the wet-bulb temperature?
- A) 3DC C) 7DC
 B) 5DC D) 10DC
- 83) What is the approximate dewpoint temperature if the dry-bulb temperature is 13DC and the wet-bulb temperature is 10DC? [Refer to the *Earth Science Reference Tables*.]
- A) -25DC C) 7DC
 B) 3DC D) 10DC
- 84) During a heavy rainfall, runoff will be *greatest* on a soil that has an infiltration (permeability) rate of
- A) 0.1 cm/sec C) 1.2 cm/sec
 B) 0.3 cm/sec D) 0.2 cm/sec
- 85) According to the *Earth Science Reference Tables*, at which of these latitudes would average annual precipitation be *greatest*?
- A) 90D S C) 0D
 B) 90D N D) 30D N

Questions 86 through 89 refer to the following:

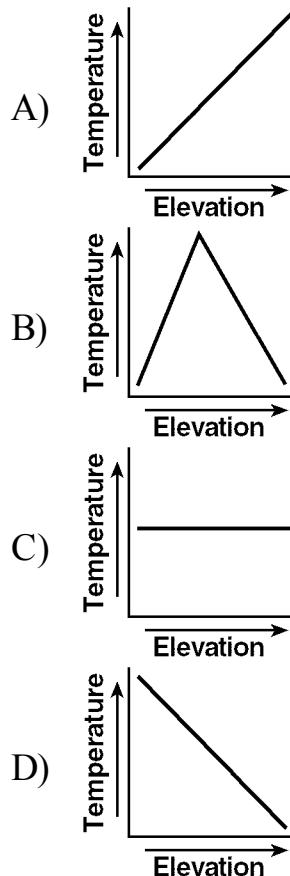
The diagram below represents a satellite image of Hurricane Gilbert in the Gulf of Mexico. Each X represents the position of the eye of the storm on the date indicated.



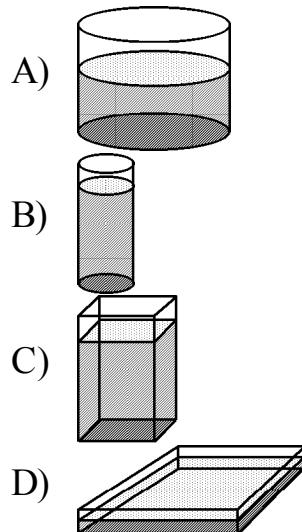
- 86) The air mass that gave rise to Hurricane Gilbert would be identified as
- A) cT C) mP
 B) cP D) mT
- 87) What was the probable source of moisture for this hurricane?
- A) evaporation from the ocean
 B) winds from the coastal deserts
 C) transpiration from tropical jungles
 D) carbon dioxide from the atmosphere

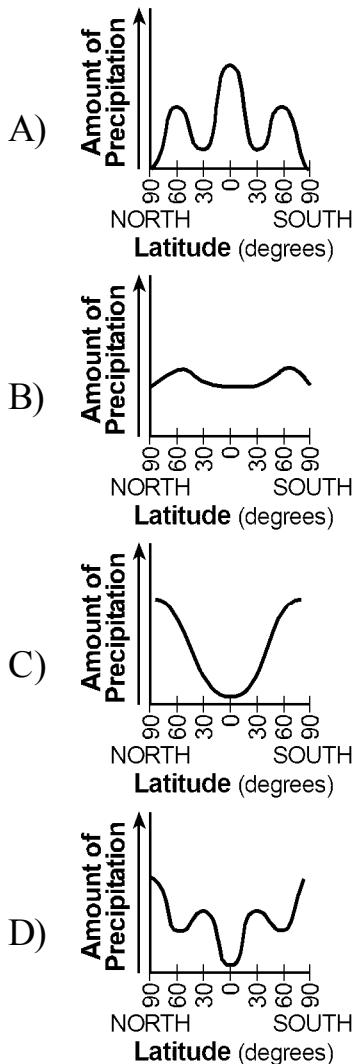
- 88) On September 18, Hurricane Gilbert changed direction. Which statement provides the most probable reason for this change?
- The amount of precipitation released by the storm changed suddenly.
 - The air mass was cooled by the land surface.
 - The amount of insolation received by the air mass decreased.
 - The storm entered the prevailing westerlies wind belt.
- 89) The surface wind pattern associated with Hurricane Gilbert was
- clockwise and toward the center
 - councclockwise and toward the center
 - councclockwise and away from the center
 - clockwise and away from the center

- 90) Which graph *best* shows the general effect that differences in elevation above sea level have on the average annual temperature?

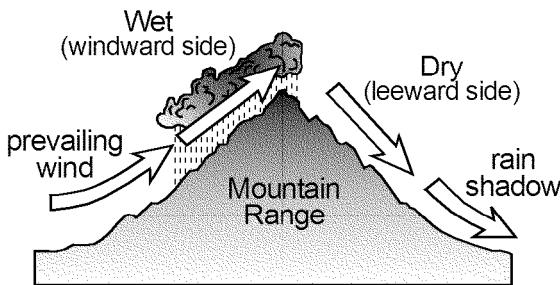


- 91) All of the containers shown below contain the same volume of water and are at room temperature. In a two-day period, from which container will the *least* amount of water evaporate?





- 94) The cross section below shows how prevailing winds have caused different climates on the windward and leeward sides of a mountain range.



Why does the windward side of this mountain have a wet climate?

- A) Rising air compresses and cools, causing the water droplets to evaporate.
 - B) Rising air compresses and warms, causing the water vapor to condense.
 - C) Rising air expands and cools, causing the water vapor to condense.
 - D) Rising air expands and warms, causing the water droplets to evaporate.

- 95) According to the *Earth Science Reference Tables*, what is the approximate dewpoint temperature when the dry-bulb temperature is 15DC and the wet-bulb temperature is 15DC?

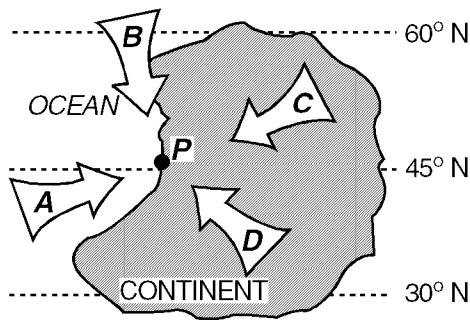
A) 15DC C) 10DC
B) 5DC D) 0DC

96) By which process does water vapor leave the atmosphere and form dew?

A) convection
B) precipitation
C) transpiration
D) condensation

- 97) According to the *Earth Science Reference Tables*, what is the dewpoint temperature when the dry-bulb temperature is 12DC and the wet-bulb temperature is 7DC?

- 98) The map below shows an imaginary continent in the Earth's planetary wind belt between 30° D and 60° D North latitude. Location P is on the western edge of the continent.



Location *P* has mild winters with much precipitation. Which arrow indicates the direction of the prevailing winds at this location?

- 99) When molecules of water evaporate into the air and replace the heavier molecules of oxygen and nitrogen, the density of the air generally

 - A) increases
 - B) decreases
 - C) remains the same

- 100) In winter, a cold, dry air mass from Canada moves across Lake Ontario. The air over the lake is warmer and more humid than the air over the land. Which weather condition is most likely to occur as the air mass reaches Oswego?

A) lake-effect snowstorm
B) warm, sunny weather
C) hurricane
D) tornado

101) How does the average annual surface temperature compare from latitude to latitude?

A) As latitude increases, the average annual surface temperature decreases.
B) As latitude increases, the average annual surface temperature remains the same.
C) As latitude increases, the average annual surface temperature increases.

102) According to the *Earth Science Reference Tables*, an air pressure of 30.15 inches of mercury is equal to

A) 1023 mb
B) 1017 mb
C) 1021 mb
D) 1019 mb

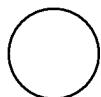
103) According to the "Dewpoint Temperature Chart" in the *Earth Science Reference Tables*, what is the dewpoint if the air temperature is 14DC and the wet-bulb temperature is 9DC?

A) 4DC C) 9DC

- 104) A weather station records the following data:

Air pressure is 1,001.0 millibars.
Wind is from the south.
Wind speed is 25 knots.

Using the proper weather map symbols, place this information in the correct locations on the weather station model provided below.

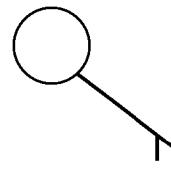


- 105) When the height of the mercury in a barometer is 29.92 inches, the barometric pressure is
- 1,005.5 mb
 - 1,000.0 mb
 - 1,020.4 mb
 - 1,013.2 mb

- 106) What is the approximate dewpoint temperature if the dry-bulb temperature is 26DC and the wet-bulb temperature is 21DC? [Refer to the *Earth Science Reference Tables*.]
- | | |
|---------|---------|
| A) 9DC | C) 5DC |
| B) 18DC | D) 12DC |

- 107) Plot the following data on the weather station model below.

Dewpoint = 74DF,
Cloud cover = 100%

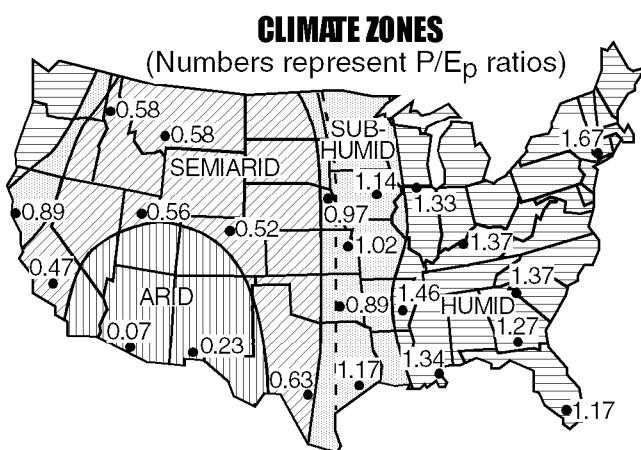


- 108) An air mass classified as **mT** usually forms over what type of Earth surface?
- warm water
 - cool water
 - warm land
 - cool land
- 109) A strong west wind steadily blew over Lake Ontario picking up moisture. As this moist air flowed over the Tug Hill Plateau, the plateau received a 36-inch snowfall. This snow fell from clouds that formed when rising air was
- cooled by expansion, causing water vapor to condense
 - cooled by compression, causing water vapor to condense
 - warmed by expansion, causing water vapor to evaporate
 - warmed by compression, causing water vapor to evaporate
- 110) An air temperature of 30DC is equal to
- | | |
|----------|---------|
| A) -22DF | C) 74DF |
| B) 86DF | D) -2DF |

- 111) According to the *Earth Science Reference Tables*, a barometric pressure reading of 28.97 inches is equal to
- 1,006 mb
 - 984 mb
 - 981 mb
 - 1,008 mb
- 112) Compared to a maritime tropical airmass, a maritime polar airmass has
- higher temperature and less water vapor
 - lower temperature and less water vapor
 - lower temperature and more water vapor
 - higher temperature and more water vapor

Questions 113 and 114 refer to the following:

The map below shows the generalized climatic zones of the United States based on the P/E_p ratio (average yearly precipitation divided by average yearly potential evapotranspiration).

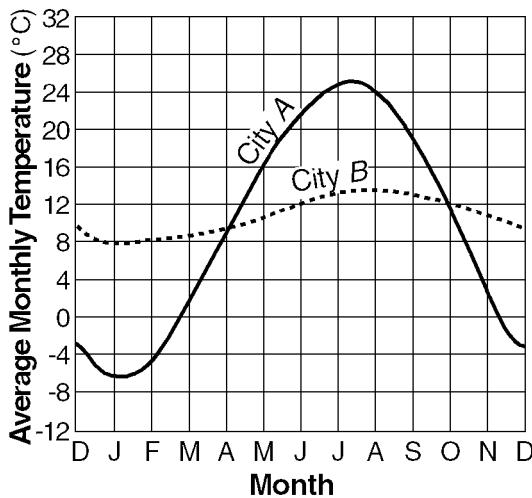


- 113) The climate of New York State is classified as
- arid
 - humid
 - semiarid
 - subhumid
- 114) A P/E_p ratio of 0.59 is classified as
- subhumid
 - arid
 - humid
 - semiarid
- 115) Why do clouds usually form at the leading edge of a cold airmass?
- Cold air flows over warm air, causing warm air to descend and cool.
 - Cold air flows under warm air, causing the warm air to rise and cool.
 - Cold air contains more dust particles than warm air does.
 - Cold air contains more water vapor than warm air does.
- 116) In order for clouds to form, cooling air must be
- saturated and have no condensation nuclei
 - saturated and have condensation nuclei
 - unsaturated and have condensation nuclei
 - unsaturated and have no condensation nuclei
- 117) A high-pressure center is generally characterized by
- warm, dry weather
 - cool, wet weather
 - warm, wet weather
 - cool, dry weather

118) According to the *Earth Science Reference Tables*, what is the dewpoint temperature when the drybulb temperature is 14DC and the wet-bulb temperature is 10DC?

- A) -17DC
- C) 3DC
- B) 4DC
- D) 6DC

119) The graph below shows the average monthly temperatures for two cities, *A* and *B*, which are *both* located at 41°D north latitude.



Which statement *best* explains the difference in the average yearly temperature range for the two cities?

- A) City *B* is located near a large body of water.
- B) City *B* receives less yearly precipitation.
- C) City *B* is located in a different planetary wind belt.
- D) City *B* has a greater yearly duration of insolation.

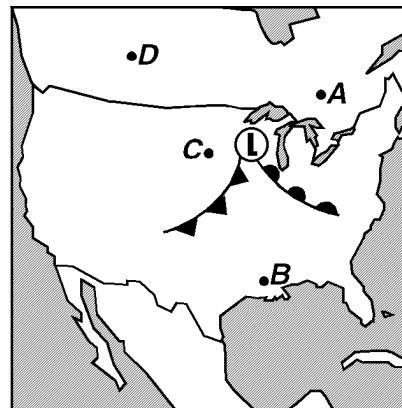
120) Which combination of air temperature and dewpoint temperature would most likely occur in humid air?

- A) air temperature 26DC, dewpoint temperature 10DC
- B) air temperature 10DC, dewpoint temperature -4DC
- C) air temperature 24DC, dewpoint temperature 23DC
- D) air temperature 15DC, dewpoint temperature 3DC

121) Rainfall is most likely to infiltrate into soil that is

- A) impermeable and saturated
- B) impermeable and unsaturated
- C) permeable and saturated
- D) permeable and unsaturated

122) The map of North America below shows a low-pressure center and its associated fronts. The letters *A*, *B*, *C*, and *D* represent weather stations.

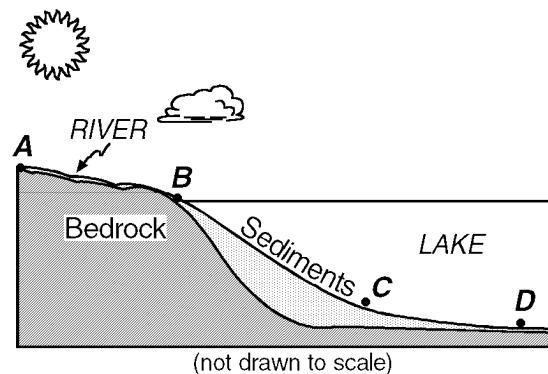


If this weather system follows a typical path, at which station would the low-pressure center be located in about 24 hours?

- A) station *A*
- B) station *B*
- C) station *C*
- D) station *D*

- 123) Compared to a coastal location of the same elevation and latitude, an inland location is likely to have
- warmer summers and cooler winters
 - cooler summers and warmer winters
 - warmer summers and warmer winters
 - cooler summers and cooler winters
- 124) As wind velocity decreases, the distance between isobars on a weather map will
- remain the same
 - increase
 - decrease
- 125) Clouds usually form when
- relative humidity is 0%
 - evaporation has warmed the surrounding air
 - air temperature reaches the dewpoint
 - condensation nuclei have been removed from the air
- 126) Compared to a maritime tropical air mass, a continental polar air mass is
- cooler and contains less moisture
 - warmer and contains more moisture
 - cooler and contains more moisture
 - warmer and contains less moisture
- 127) An air pressure of 1023 millibars is equal to how many inches of mercury?
- | | |
|----------|----------|
| A) 30.10 | C) 30.21 |
| B) 30.19 | D) 30.15 |

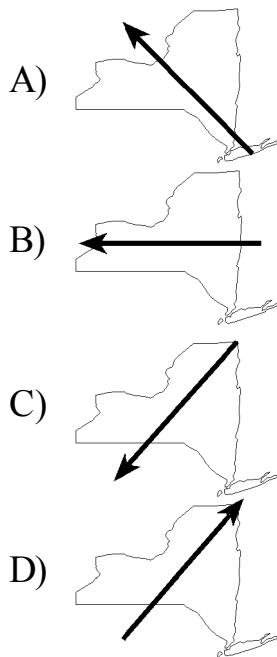
- 128) The diagram below represents a river flowing into a large lake on a hot, sunny afternoon in July in New York State. The river is carrying particles ranging in size from cobbles to clay.



What is the most likely reason that no rain is falling from the cloud shown in this diagram?

- The air directly above the lake is saturated.
- The air pressure is decreasing.
- The water droplets are too tiny to fall.
- A strong wind is blowing.

- 129) In which map does the arrow show the general direction that *most* low-pressure storm systems move across New York State?

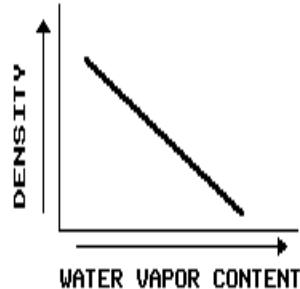


- 130) Name the weather instrument used to measure the air pressure at the center of a low pressure system.

- 131) Atmospheric transparency is most likely to increase after
- precipitation
 - volcanic eruptions
 - industrial activity
 - forest fires

- 132) A student uses a sling psychrometer outdoors on a clear day. The dry-bulb (air) temperature is 10DC. The water on the wet bulb will most likely
- condense, causing the wet-bulb temperature to be equal to the air temperature
 - evaporate, causing the wet-bulb temperature to be equal to the air temperature
 - evaporate, causing the wet-bulb temperature to be lower than the air temperature
 - condense, causing the wet-bulb temperature to be higher than the air temperature

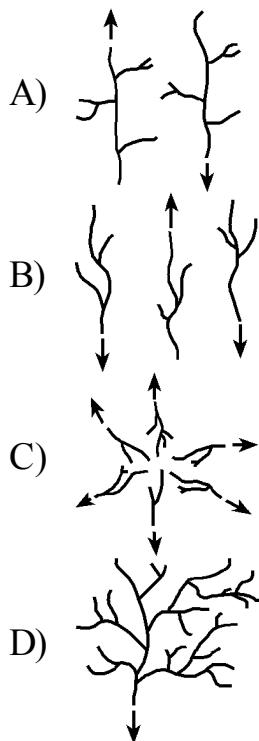
- 133) According to the graph below, what happens to the density of a mass of air when its water vapor content increases?



- 134) Which symbol would be used to identify an air mass originating in central Canada?
- | | |
|-------|-------|
| A) mP | C) cP |
| B) mT | D) cT |

- 135) At which dewpoint temperature would the amount of water vapor in the air be *greatest*?
- | | |
|---------|---------|
| A) 18DC | C) 20DC |
| B) 0DC | D) 10DC |

- 136) According to the *Earth Science Reference Tables*, which abbreviation indicates a warm air mass that contains large amounts of water vapor?



- 138) Which conditions are most likely to develop over a land area adjacent to the ocean on a hot, sunny afternoon?

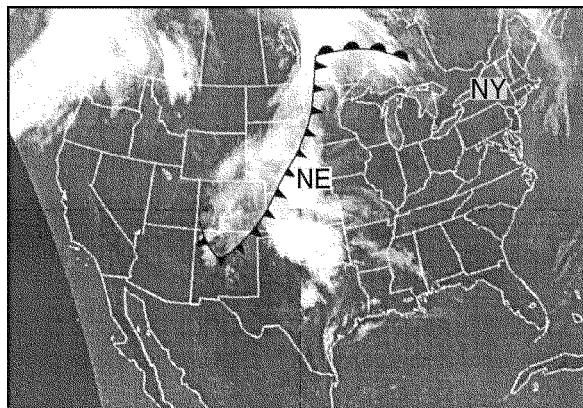
 - A) lower temperatures, with winds blowing in from the ocean
 - B) higher temperatures, with winds blowing out toward the ocean
 - C) higher temperatures, with winds blowing in from the ocean
 - D) lower temperatures, with winds blowing out toward the ocean

- 139) Warm water from tropical oceans is carried to northern Europe by the Gulf Stream and the

 - A) Brazil Current
 - B) Canaries Current
 - C) North Atlantic Current
 - D) Alaska Current

Questions 140 and 141 refer to the following:

The satellite image below shows cloud patterns associated with weather fronts over the United States on a certain day. The states of Nebraska (NE) and New York (NY) have been labeled.



- 140) At the time this satellite image was taken, what were the weather conditions in New York State?

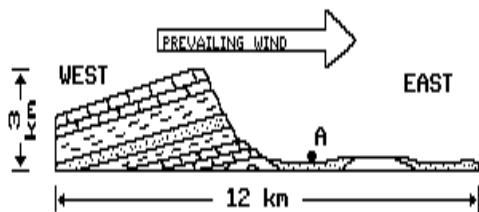
 - A) cloudy with heavy precipitation
 - B) mostly cloudy in the northern part of the State and clear in the southern part
 - C) clear skies with no precipitation
 - D) very cloudy with no precipitation

141) Which type of front was producing the weather in Nebraska when this image was taken?

 - A) warm front
 - B) stationary front
 - C) occluded front
 - D) cold front

- 142) According to the *Earth Science Reference Tables*, the prevailing winds at 45° S latitude are from the
- northeast
 - southwest
 - southeast
 - northwest

- 143) In the diagram below, the mountains west of point A have been rising. If all other factors remain unchanged, what will be the most probable long-range effect on the area around point A?



- decreasing rainfall
- increasing cloud cover
- decreasing temperature
- increasing insolation

- 144) Why do most clouds form in the troposphere? [Refer to the *Earth Science Reference Tables*.]
- Air pressure rises with increasing altitude.
 - The other layers of the atmosphere are too cold to contain water.
 - The dewpoint is too high in the other layers of the atmosphere.
 - The lowest 11 km of the atmosphere contains almost all of the atmospheric water vapor.

- 145) According to the *Earth Science Reference Tables*, the climate of which location in New York State is influenced *least* by large bodies of water?

- Jamestown
- Binghamton
- Buffalo
- New York City

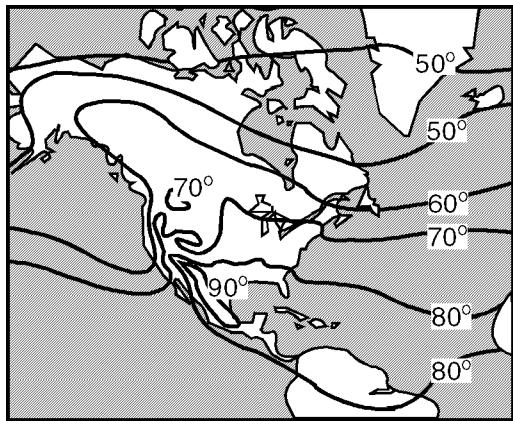
- 146) The energy gained by water during evaporation is later released by the water vapor during the process of
- melting
 - transpiration
 - convection
 - condensation

- 147) According to the *Earth Science Reference Tables*, an air pressure of 29.47 inches of mercury is equal to
- 998 mb
 - 996 mb
 - 1,014 mb
 - 1,002 mb

- 148) The air outside a classroom has a dry-bulb temperature of 10°C and a wet-bulb temperature of 4°C. What is the relative humidity of this air?
- | | |
|--------|--------|
| A) 54% | C) 1% |
| B) 33% | D) 14% |

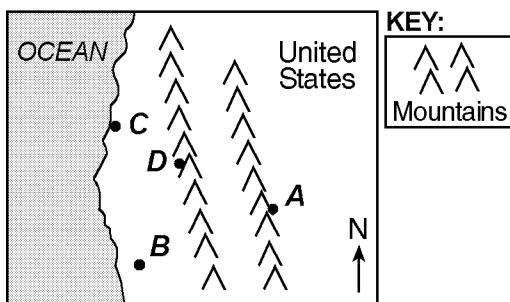
Questions 149 and 150 refer to the following:

The diagram below represents an isotherm map of North America and part of South America. The map shows the average daily temperature in degrees Fahrenheit during 1 month of the year.



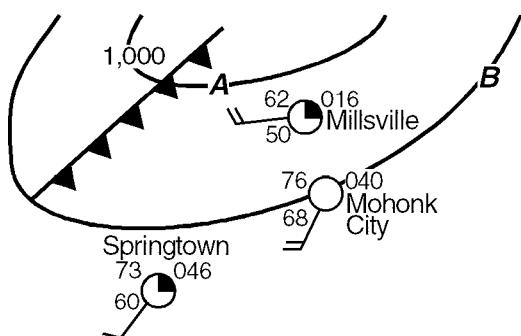
- 149) Why does the 60-degree isotherm bend northward in the Northern Hemisphere during the time of year when the data was recorded?
- The mid-ocean ridges are heating the ocean water.
 - Warm ocean currents are moving northward along both coasts.
 - A high-pressure air mass is centered over North America.
 - The land is warmer than the ocean.
- 150) This map could represent the average daily temperature for the month of
- March
 - January
 - November
 - July

- 151) The map below shows the location of four cities, A, B, C, and D, in the western United States where prevailing winds are from the southwest.



- Which city most likely receives the *least* amount of average yearly precipitation?
- A) A C) C
B) B D) D
- 152) In general, the probability of flooding decreases when there is an increase in the amount of
- runoff
 - snow melt
 - infiltration
 - precipitation

- 153) The weather map below shows a cold front approaching three cities. The two isobars are labeled *A* and *B*.



What is the probable value of isobar *B*?

- A) 1,004.0 mb
- B) 997.6 mb
- C) 904.0 mb
- D) 1,004.6 mb

- 154) Tornadoes occur when a very cold, dry air mass meets a very warm, wet air mass. Which two air masses would most likely form a tornado when they meet?
- A) **mP** and **mT**
 - B) **cP** and **cA**
 - C) **cP** and **mT**
 - D) **cT** and **mP**

- 155) Which event will most likely occur in rising air?
- A) decreasing relative humidity
 - B) increasing temperature
 - C) cloud formation
 - D) clearing skies

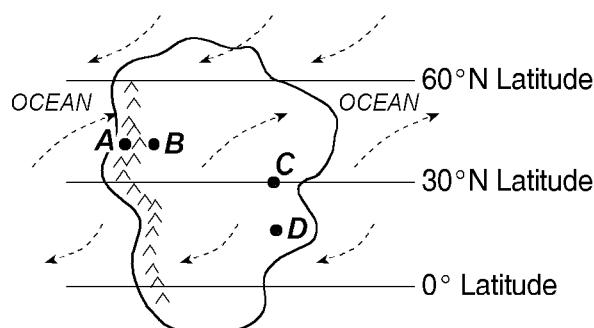
- 156) On a clear, dry day an air mass has a temperature of 20DC and a dewpoint temperature of 10DC. According to the *Earth Science Reference Tables*, about how high must this air mass rise before a cloud can form?

- A) 1.6 km
- C) 3.0 km
- B) 2.8 km
- D) 2.4 km

- 157) An air mass originating over north central Canada would most likely be
- A) cold and moist
 - B) warm and dry
 - C) cold and dry
 - D) warm and moist

Questions 158 through 160 refer to the following:

The map below shows an imaginary continent on Earth. Arrows represent prevailing wind directions. Letters *A* through *D* represent locations on the continent. Locations *A* and *B* are at the same latitude and at the same elevation at the base of the mountains.

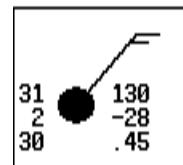


- 158) Compared to the observations made at location *D*, the observed altitude of Polaris at location *B* is
- A) only greater from March 21 to September 22
 - B) only less from March 21 to September 22
 - C) always greater
 - D) always less

- 159) Over the course of a year, compared to location *B*, location *A* will have
- more precipitation and a smaller temperature range
 - less precipitation and a smaller temperature range
 - more precipitation and a greater temperature range
 - less precipitation and a greater temperature range
- 160) The climate at location *C* is much drier than at location *D*. This difference is *best* explained by the fact that location *C* is located
- at a latitude where air is sinking and surface winds diverge
 - at a latitude that experiences longer average annual daylight
 - closer to a large body of water
 - farther from any mountain range
- 161) During the warmest part of a June day, breezes blow from the ocean toward the shore at a Long Island beach. Which statement best explains why this happens?
- Winds never blow from the shore toward the ocean.
 - Winds usually blow from hot to cold areas.
 - Air pressure over the land is higher than air pressure over the ocean.
 - Air pressure over the ocean is higher than air pressure over the land.

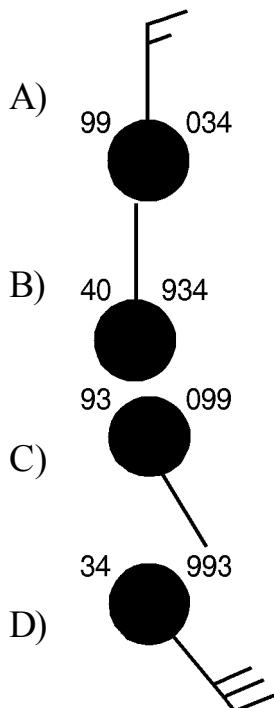
Questions 162 and 163 refer to the following:

The diagram below shows a weather station.

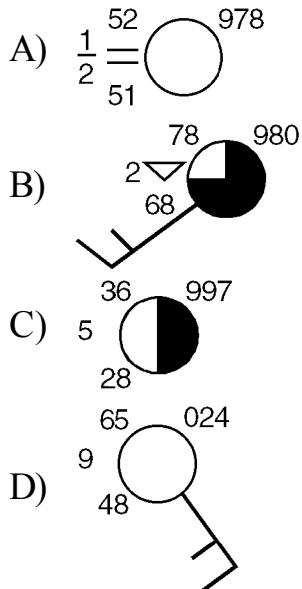


- 162) The barometric pressure is
- 10.28 mb
 - 1013.0 mb
 - 913.0 mb
 - 130.0 mb
- 163) The weather forecast for the next 6 hours at this station most likely would be
- overcast, hot, poor visibility
 - sunny, cold, probable rain
 - overcast, cold, probable snow
 - overcast, hot, unlimited visibility
- 164) The Florida and Gulf Stream ocean currents along the east coast of North America are both
- warm currents that flow southwestward
 - warm currents that flow northeastward
 - cool currents that flow northeastward
 - cool currents that flow southwestward

- 165) Which weather-station model shows an air pressure of 993.4 millibars?

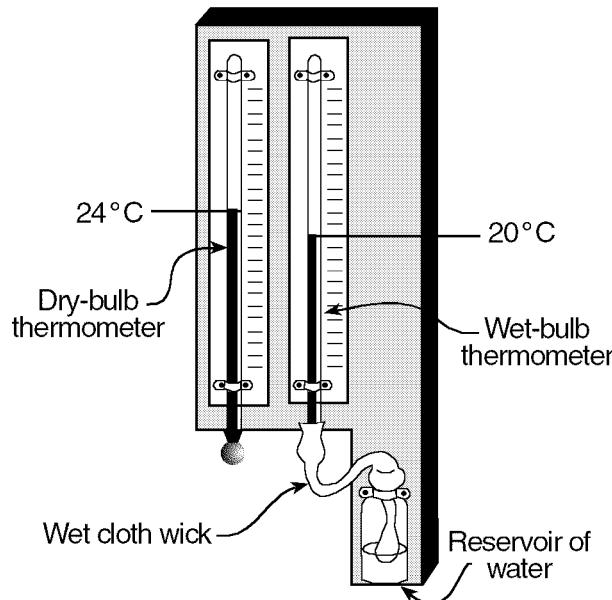


- 166) An airmass located over the central United States will most likely move toward the
- southeast
 - northwest
 - northeast
 - southwest
- 167) At which weather station is visibility *greatest*?



Questions 168 through 170 refer to the following:

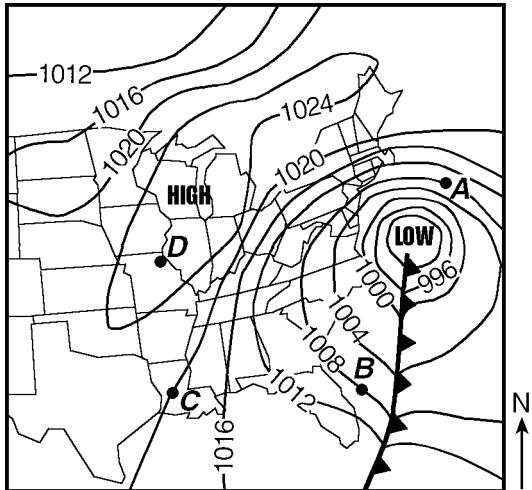
The diagram below shows a hygrometer located on a wall in a classroom. The hygrometer's temperature readings are used by the students to determine the relative humidity of the air in the classroom.



- 168) Based on the temperature readings shown in this diagram, determine the relative humidity of the air in the classroom.
- 169) Besides relative humidity, identify another weather variable of the air in the classroom that may be determined by using *both* temperature readings on the hygrometer.
- 170) Describe how water evaporating from the wick attached to the wet-bulb thermometer lowers the temperature reading of that thermometer.

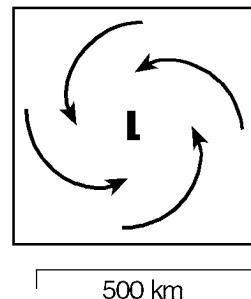
Questions 171 through 173 refer to the following:

On the weather map below, points A, B, C, and D are locations on Earth's surface.



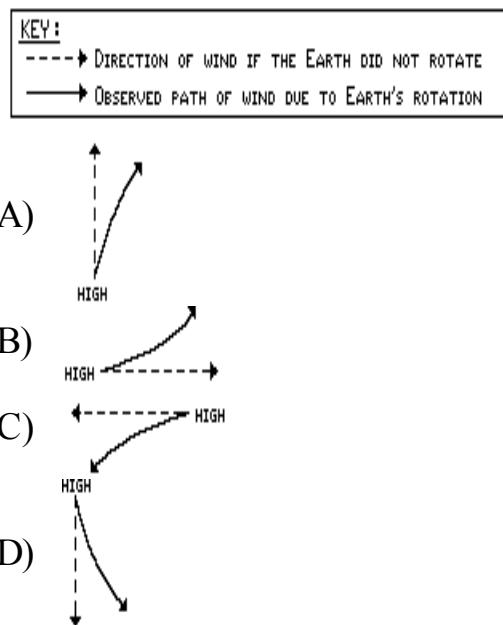
- 171) The *strongest* winds are *closest* to location
- A
 - B
 - C
 - D
- 172) Which type of front extends southward from the center of the low?
- occluded
 - cold
 - stationary
 - warm
- 173) The isolines on the map represent values of air
- pressure
 - temperature
 - humidity
 - density

- 174) A map view of surface air movement in a low-pressure system is shown below.



- The air near the center of this low-pressure system usually will
- rise and form clouds
 - reverse direction
 - squeeze together to form a high-pressure system
 - evaporate into a liquid
- 175) Which factor most directly affects the wind speed between two locations?
- Coriolis force
 - air pressure
 - dewpoint temperature
 - cloud cover

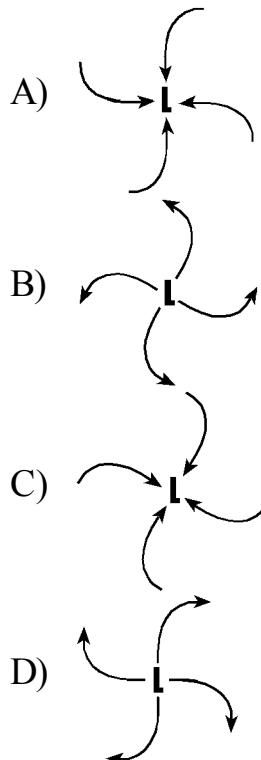
- 176) Which drawing best illustrates the general result that the Earth's rotation would have on the direction of the wind as it moves away from the center of a high-pressure system in the Northern Hemisphere?



- 177) The air temperature is 10DC. Which dewpoint temperature would result in the highest probability of precipitation?

- | | |
|---------|--------|
| A) -4DC | C) 8DC |
| B) 6DC | D) 0DC |

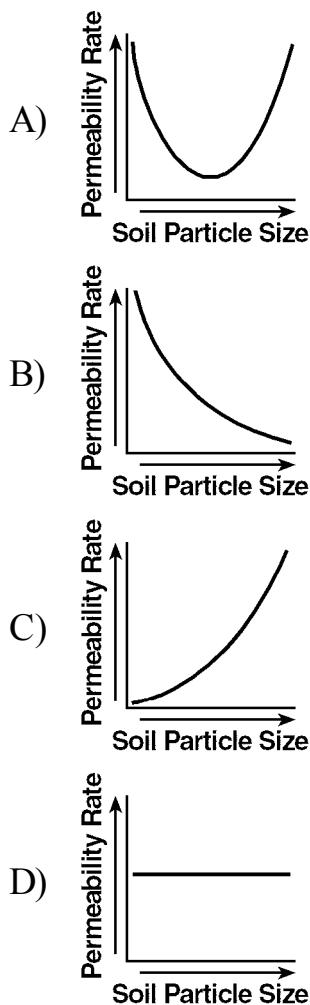
- 178) Which map view *best* shows the movement of surface air around a low-pressure system in the Northern Hemisphere?



- 179) According to the *Earth Science Reference Tables*, when the dry-bulb temperature reading is 10.DC and the wet-bulb temperature is 2.0DC, the dewpoint temperature of the air is approximately

- | | |
|-----------|----------|
| A) -8.0DC | C) 10.DC |
| B) -14.DC | D) 2.0DC |

- 180) Which graph *best* represents the general relationship between soil particle size and the permeability rate of infiltrating rainwater?



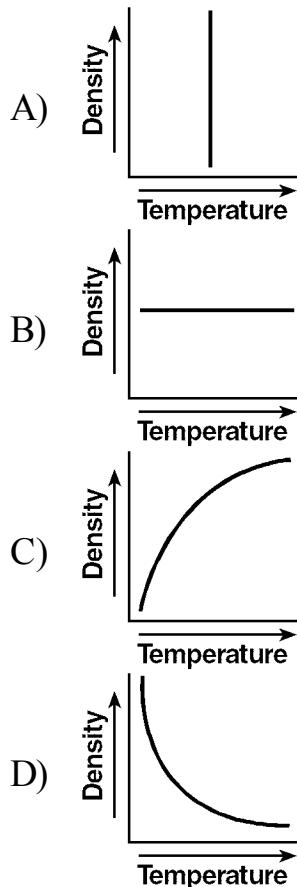
- 181) According to the *Earth Science Reference Tables*, what is the approximate dewpoint temperature when the dry-bulb temperature is 18DC and the wet-bulb temperature is 15DC?

A) 8.0DC C) 13DC
B) 10.0DC D) 11DC

- 182) Which process is most likely to remove pollutants from the air?

A) evaporation
B) runoff
C) transpiration
D) precipitation

- 183) Which graph *best* represents the relationship between air temperature and air density in the atmosphere?



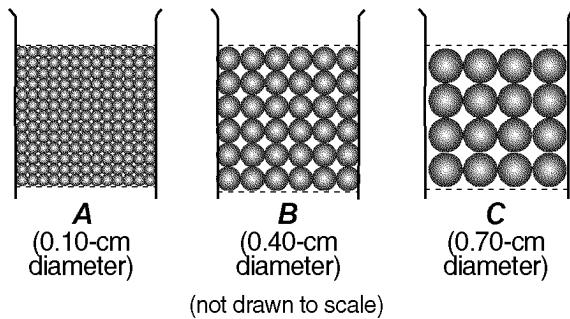
- 184) What is the dewpoint temperature when the air temperature is 18DC and the wet-bulb temperature is 13DC?

A) 9DC C) 13DC
B) 6DC D) 25DC

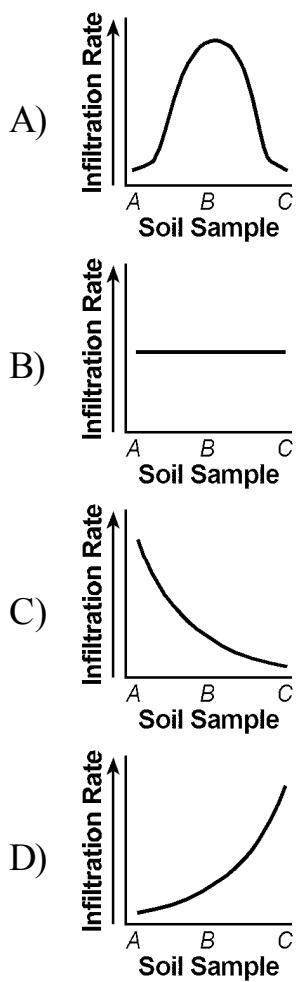
- 185) As warm, moist air moves into a region, barometric pressure readings in the region will generally

A) increase
B) remain the same
C) decrease

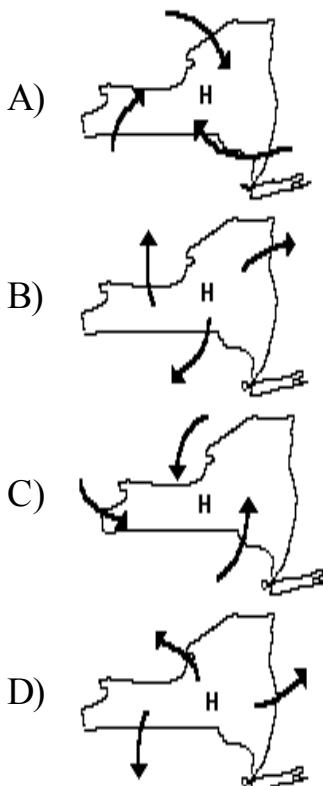
- 186) The diagrams below show the relative sizes of particles from soil samples A, B, and C. Equal volumes of each soil sample were placed in separate containers. Each container has a screen at the bottom. Water was poured through each sample to determine the infiltration rate.



Which graph *best* shows how the infiltration rates of the three soil samples would compare?

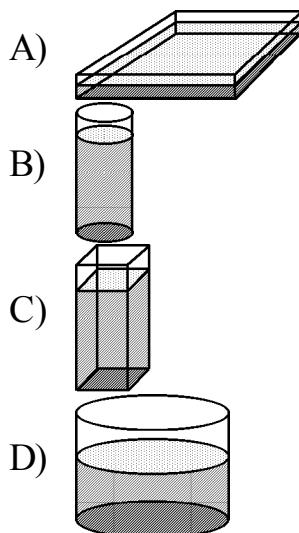


- 187) Which map best represents the normal air circulation around a high pressure air mass located over central New York State?



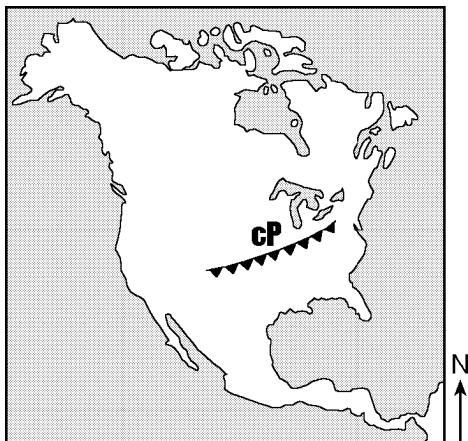
- 188) At what temperature would ice crystals form from air that has a dewpoint temperature of -6DC?
- | | |
|--------|---------|
| A) 0DC | C) -2DC |
| B) 6DC | D) -6DC |

- 189) Equal quantities of water are placed in four uncovered containers with different shapes and left on a table at room temperature. From which container will the water evaporate most rapidly?



Questions 190 through 192 refer to the following:

The weather map of North America below shows the location of a front and the air mass influencing its movement.

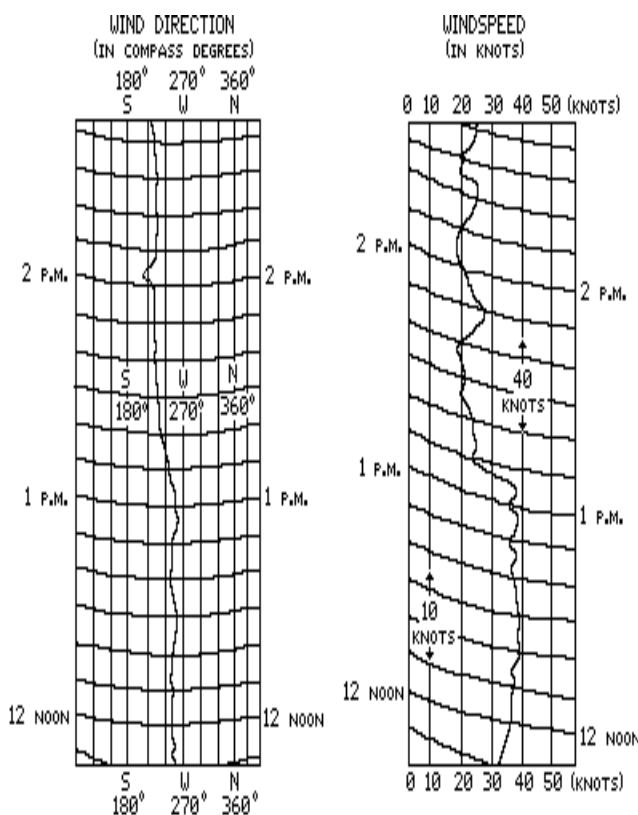


- 190) Which type of front and frontal movement is shown on the weather map?
- A) warm front moving southeastward
 - B) cold front moving southeastward
 - C) cold front moving northwestward
 - D) warm front moving northwestward
- 191) The **cP** air mass is identified on the basis of its temperature and
- A) wind direction
 - B) cloud cover
 - C) moisture content
 - D) windspeed
- 192) Which region is the probable source of the air mass labeled **cP** on the map?
- A) North Atlantic Ocean
 - B) central Canada
 - C) Gulf of Mexico
 - D) southwestern United States
- 193) A balloon carrying weather instruments is released at the Earth's surface and rises through the troposphere. As the balloon rises, what will the instruments generally indicate?
- A) an increase in both air temperature and air pressure
 - B) a decrease in air temperature and an increase in air pressure
 - C) a decrease in both air temperature and air pressure
 - D) an increase in air temperature and a decrease in air pressure

- 194) Pollutants are most likely to be removed from the atmosphere by
- precipitation
 - transpiration
 - volcanic activity
 - evaporation
- 195) Which weather change usually occurs when the difference between the air temperature and the dewpoint temperature is decreasing?
- The amount of cloud cover decreases.
 - The relative humidity increases.
 - The probability of precipitation decreases.
 - The barometric pressure increases.
- 196) A strong wind blowing from the northwest toward the southeast would be caused primarily by differences in
- dewpoint temperature
 - cloud cover
 - elevation
 - air pressure

Questions 197 through 201 refer to the following:

The data below shows the recorded wind directions and windspeeds associated with a snowstorm in December at the shoreline of Lake Erie in western New York State. The snowstorm began at 1:10 p.m.



- 197) According to the graph, when the storm arrived at this location, the windspeed
- remained the same
 - increased
 - decreased
- 198) When the storm began, the atmospheric transparency (visibility) most likely
- increased
 - decreased
 - remained the same

199) Before the storm arrived at this location, the wind direction was primarily

- A) southeast
- B) south
- C) northwest
- D) west

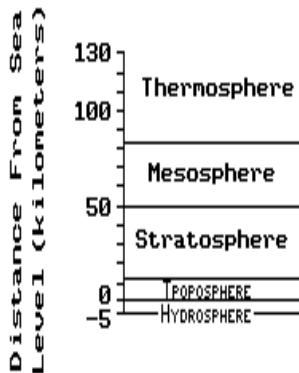
200) According to the *Earth Science Reference Tables*, the airmass that moved over this location most likely obtained moisture by passing over

- A) the Adirondack Mountains
- B) Lake Erie
- C) the Appalachian Uplands
- D) the Atlantic Ocean

201) At approximately what time was an average windspeed of 40 knots recorded?

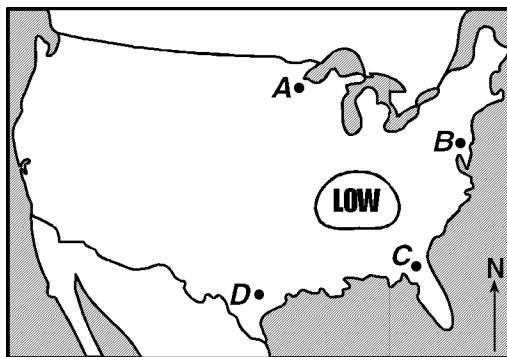
- A) 12:30 p.m.
- B) 1:30 p.m.
- C) 1:20 p.m.
- D) 2:10 p.m.

202) At which interface in the diagram below is the moisture content of the air likely to be highest?



- A) thermosphere-mesosphere
- B) mesosphere-stratosphere
- C) stratosphere-troposphere
- D) troposphere-hydrosphere

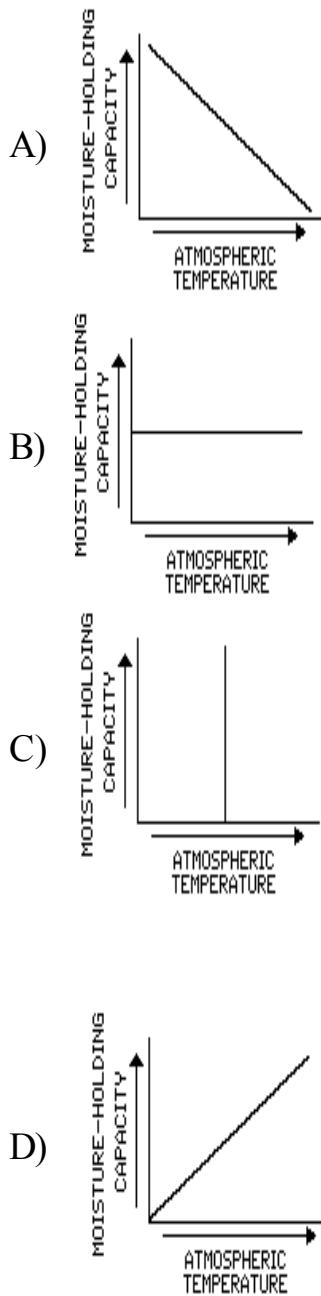
203) A low-pressure system is shown on the weather map below.



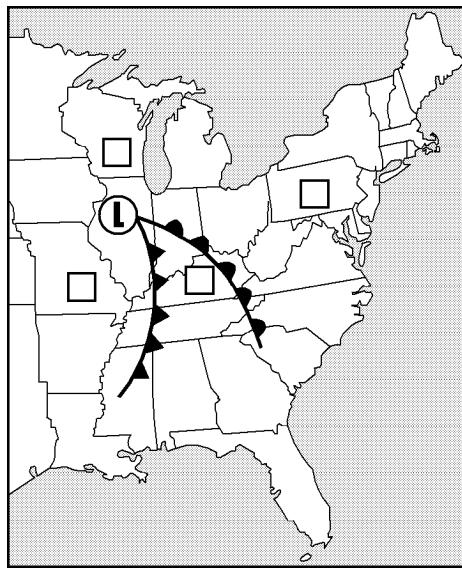
Toward which point will the low-pressure system move if it follows a typical storm track?

- A) A
- B) B
- C) C
- D) D

- 204) Which graph best represents the relationship between the moisture-holding capacity (ability to hold moisture) of the atmosphere and atmospheric temperature?



- 205) The weather map below shows a typical midlatitude low-pressure system centered in Illinois.



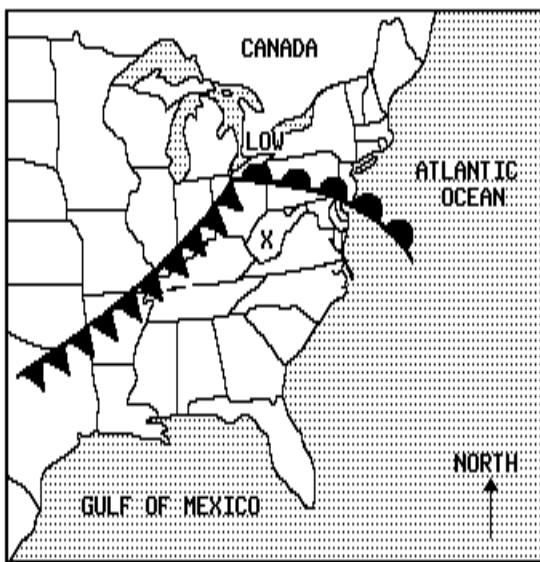
- (a) On this weather map, indicate which boxed area has the *highest* surface air temperatures by marking an X in one of the four boxes on the map.
- (b) On the weather map above, draw an arrow to predict the normal storm track that this low-pressure center would be expected to follow.

- 206) During a rainfall, surface runoff will probably be *greatest* in an area that has a
- gentle slope and a tree-covered surface
 - steep slope and a gravel-covered surface
 - steep slope and a clay-covered surface
 - gentle slope and a grass-covered surface

207) What is the approximate dewpoint temperature if the dry-bulb temperature is 10DC and the wet-bulb temperature is 8DC? [Refer to the *Earth Science Reference Tables*.]

- A) 1DC
- C) -13DC
- B) 3DC
- D) 6DC

208) The weather map below shows a frontal system that has followed a typical storm track.



The air mass located over point X most likely originated over the

- A) Gulf of Mexico
- B) northern Atlantic Ocean
- C) central part of Canada
- D) Pacific Northwest

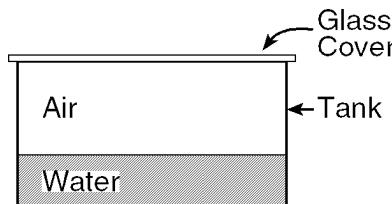
209) Which surface ocean current transports warm water to higher latitudes?

- A) West Wind Drift
- B) Labrador Current
- C) Falkland Current
- D) Gulf Stream

210) Which atmospheric conditions would cause smoke from a campfire on a beach to blow toward the ocean?

- A) humid air over the land and dry air over the ocean
- B) low-density air over the land and high-density air over the ocean
- C) high air pressure over the land and low air pressure over the ocean
- D) warm air over the land and cool air over the ocean

211) In the closed aquarium shown in the diagram below, the amount of water evaporating is equal to the amount of water vapor condensing.

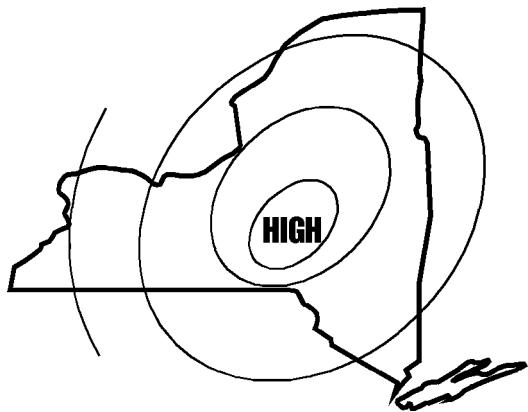


Which statement *best* explains why these amounts are equal?

- A) The air in the aquarium is saturated.
- B) The glass sides of the aquarium are warmer than the water.
- C) The relative humidity outside the aquarium is 100%.
- D) The air in the aquarium is 50% saturated.

212) Which factor is most directly related to wind velocity?

- A) dewpoint
- B) cloud type
- C) pressure gradient
- D) relative humidity



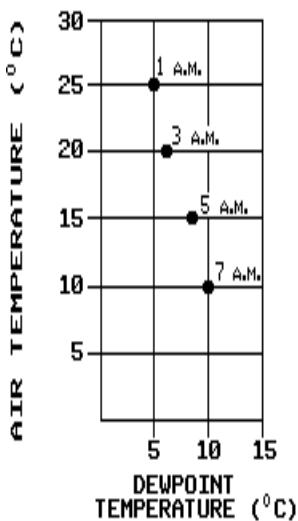
Which diagram represents the most probable wind direction in this high-pressure system?

- The figure consists of four panels labeled A, B, C, and D, each showing a map of the Great Lakes region with a high-pressure system centered over Lake Superior. The pressure gradient force is indicated by arrows pointing radially inward toward the center of the high. In panel A, the wind direction is from the southwest. In panel B, the wind direction is from the northwest. In panel C, the wind direction is from the northeast. In panel D, the wind direction is from the southeast.

- 215) According to the *Earth Science Reference Tables*, what is the approximate dewpoint temperature if the dry-bulb temperature is 18DC and the wet-bulb temperature is 11DC?

A) -10DC C) 4DC
B) 7DC D) 1DC

216) The graph below shows the air temperature and dewpoint temperature at one location at four different times during one morning.



At what time was the chance of precipitation the *greatest*?

- 217) Which one of the following statements *best* explains why climates at continental shorelines generally have a smaller yearly temperature range than inland climates at the same latitude?
- A) Land changes temperature rapidly, due to the high specific heat and lack of transparency of land.
 - B) Ocean water is a good absorber and a good conductor of heat energy.
 - C) Ocean water changes temperature slowly, due to the high specific heat and transparency of water.
 - D) Land is a poor absorber and a poor conductor of heat energy.
- 218) A temperature of 73D Fahrenheit is approximately equal to a temperature of
- A) 23D Celsius
 - B) 17D Celsius
 - C) 26D Celsius
 - D) 162D Celsius
- 219) Which statement *best* explains why precipitation occurs at the frontal surfaces between air masses?
- A) Cold fronts move slower than warm fronts.
 - B) Cold fronts move faster than warm fronts.
 - C) Warm, moist air rises when it meets cold, dry air.
 - D) Warm, moist air sinks when it meets cold, dry air.
- 220) During the summer months, which change in location would most likely cause a decrease in the observed daytime air temperatures?
- A) from sea level to 5 km above sea level
 - B) from the ocean coast to an inland location
 - C) from sea level on the windward side of a mountain to sea level on the leeward side
 - D) from 45DN latitude to 20DN latitude
- 221) The base of a cumulus cloud was determined to be 500 meters above the Earth's surface. This is the altitude at which
- A) no dust is present in the air
 - B) the air temperature drops below 0DC
 - C) cumulus clouds always form
 - D) the air temperature equals the dewpoint temperature

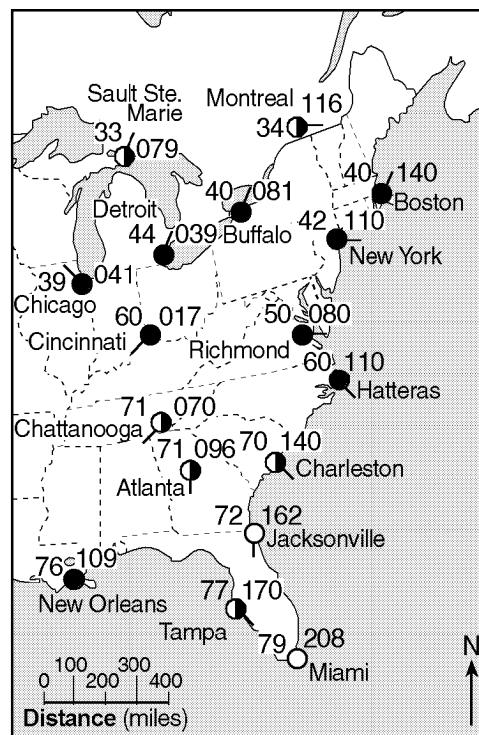
- 222) The diagram below represents a cross-sectional view of airmasses associated with a low-pressure system. The cold frontal interface is moving faster than the warm frontal interface. What usually happens to the warm air that is between the two frontal surfaces?



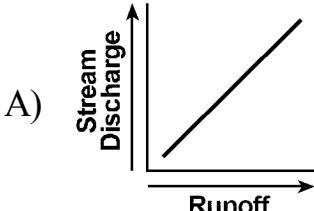
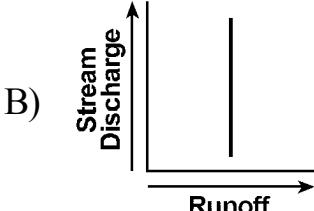
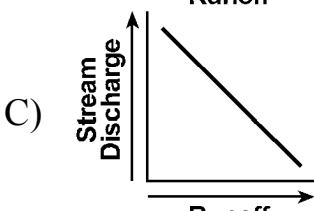
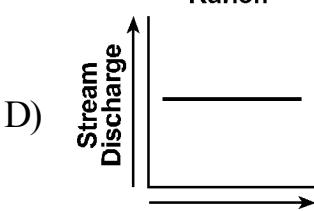
- A) The warm air is forced under the cold frontal interface but over the warm frontal interface.
 - B) The warm air is forced over both frontal interfaces.
 - C) The warm air is forced under both frontal interfaces.
 - D) The warm air is forced under the cold frontal interface but under the warm frontal interface.
- 223) Which interaction between the atmosphere and the hydrosphere causes most surface ocean currents?
- A) cooling of rising air above the ocean surface
 - B) evaporation of water from the ocean surface
 - C) seismic waves on the ocean surface
 - D) friction from planetary winds on the ocean surface

Questions 224 through 227 refer to the following:

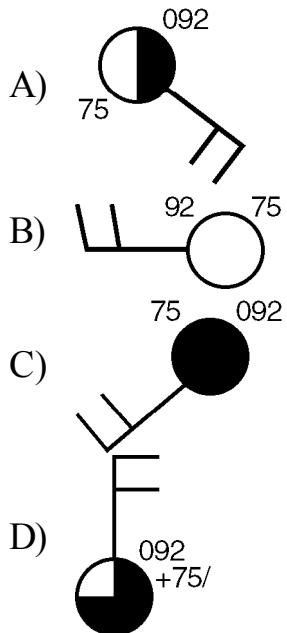
The weather map below shows partial weather-station data for several cities in eastern North America.



- 224) State the general relationship between air temperature and latitude for locations shown on the map.
- 225) State the actual air pressure, in millibars, shown at Miami, Florida on the given weather map.
- 226) On the weather given map, draw isotherms every 10°F, starting with 40°F and ending with 70°F.
[Isotherms must extend to the edges of the map.]

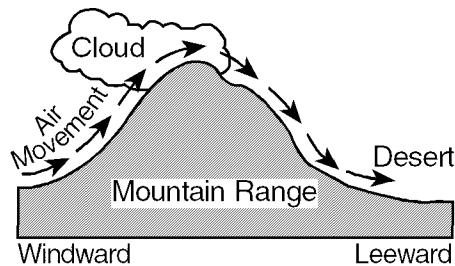
- 227) Based on the given weather map, calculate the temperature gradient between Richmond, Virginia, and Hatteras, North Carolina, by following the directions below.
- (a) Write the equation for gradient.
(b) Substitute data from the given map into the equation.
(c) Calculate the average gradient and label your answer with the correct units.
- 228) Most water vapor enters the atmosphere by the processes of
A) convection and radiation
B) evaporation and transpiration
C) condensation and precipitation
D) erosion and conduction
- 229) Which graph *best* represents the relationship between surface-water runoff and stream discharge?
- A)  A graph showing Stream Discharge on the vertical axis and Runoff on the horizontal axis. A straight line starts at the origin (0,0) and slopes upward to the right, representing a direct proportional relationship.
- B)  A graph showing Stream Discharge on the vertical axis and Runoff on the horizontal axis. A single vertical line is drawn at a constant stream discharge value, indicating no change in discharge regardless of runoff.
- C)  A graph showing Stream Discharge on the vertical axis and Runoff on the horizontal axis. A straight line starts at a positive stream discharge value on the vertical axis and slopes downward to the right, representing an inverse proportional relationship.
- D)  A graph showing Stream Discharge on the vertical axis and Runoff on the horizontal axis. A single horizontal line is drawn at a constant stream discharge value, indicating no change in discharge regardless of runoff.
- 230) Rapidly falling barometric pressure readings most likely indicate
A) clearing conditions
B) approaching storm conditions
C) decreasing humidity
D) decreasing temperatures

- 231) Which station model represents an atmospheric pressure of 1,009.2 millibars and a temperature of 75°F?



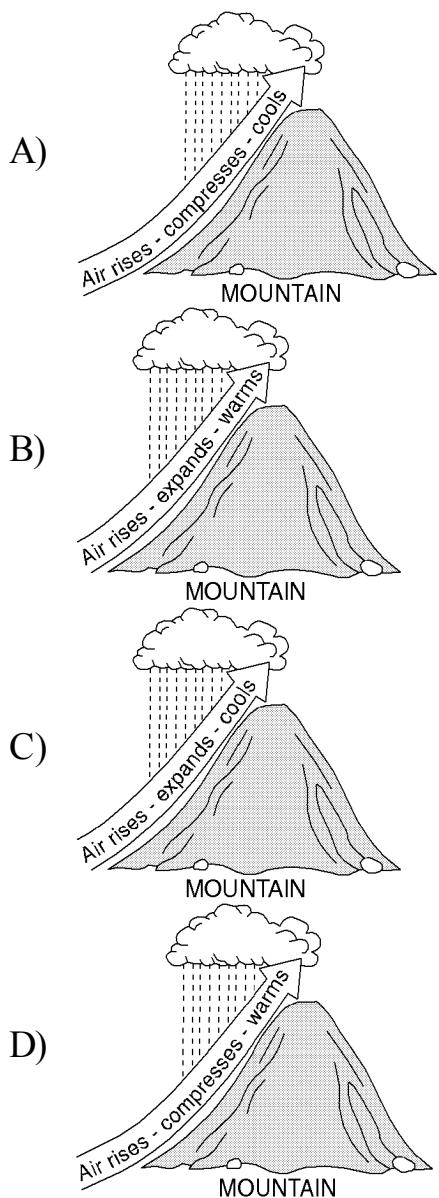
- 232) In the Northern Hemisphere, what is the direction of surface wind circulation in a high-pressure system?
- clockwise and toward the center
 - clockwise and outward from the center
 - counterclockwise and toward the center
 - counterclockwise and outward from the center
- 233) The primary reason that clouds rarely form in the stratosphere is that
- ozone prevents the formation of clouds
 - very little water vapor is present in the stratosphere
 - no condensation nuclei are present in the stratosphere
 - the temperature is too high for clouds to form

- 234) Which statement *best* explains why a desert often forms on the leeward side of a mountain range, as shown in the diagram below?

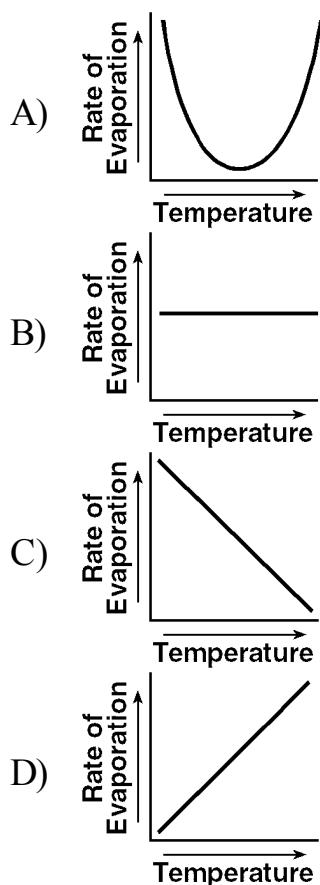


- Rising air compresses and warms.
- Sinking air expands and warms.
- Rising air expands and warms.
- Sinking air compresses and warms.

- 235) Which diagram *best* illustrates how air rising over a mountain produces precipitation?



- 236) Which graph *best* illustrates the relationship between rate of evaporation and air temperature?



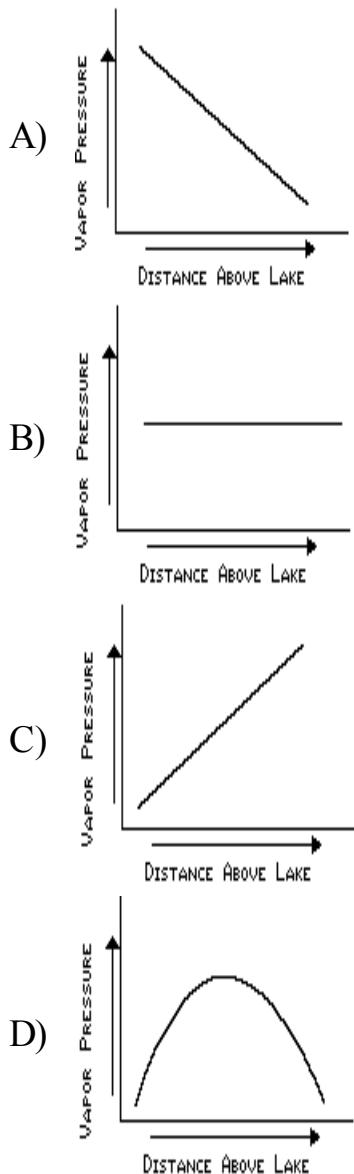
- 237) What is the dewpoint temperature when the dry-bulb reading is 18DC and the wet-bulb reading is 11DC?

- A) -10DC C) 4DC
B) 7DC D) 1DC

- 238) The air temperature and the wet-bulb temperature were measured and both were found to be 18DC. Two hours later, measurements were taken again and the air temperature was 20DC, while the wet-bulb temperature remained 18DC. The relative humidity of the air during those two hours

- A) remained the same
B) decreased
C) increased

- 239) The *greatest* source of moisture entering the atmosphere is evaporation from the surface of
- ice sheets and glaciers
 - the land
 - lakes and streams
 - the oceans
- 240) Which graph best represents the relationship between increasing distance above the water surface of a lake and the vapor pressure of the air?



- 241) Present-day weather predictions are based primarily upon
- ocean currents
 - cloud height
 - airmass movements
 - land and sea breezes
- 242) Within a low-pressure system, the probability of precipitation is high because the air is generally
- dry and rising
 - moist and sinking
 - moist and rising
 - dry and sinking
- 243) In the cartoon below, the large arrows represent surface winds.



"Residents of this tiny community are being urged to evacuate."

- What feature is found at the location to which the meteorologist is pointing?
- a high-pressure center
 - an anticyclone
 - an area of divergence
 - a low-pressure center

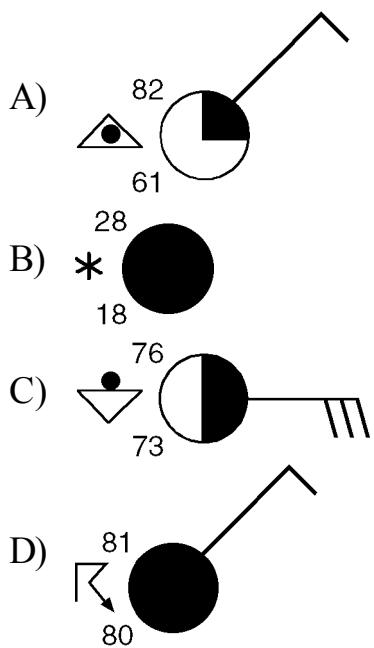
- 244) Which single factor generally has the *greatest* effect on the climate of an area on the Earth's surface?

- A) the month of the year
- B) the degrees of longitude
- C) the extent of vegetative cover
- D) the distance from the Equator

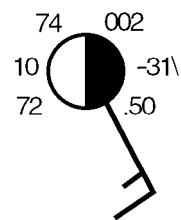
- 245) A low-pressure center located in the midwestern United States generally moves toward the

- A) southeast
- B) northeast
- C) northwest
- D) southwest

- 246) Which weather station model represents a location where a thunderstorm is occurring?



- 247) The station model below shows the weather conditions at Massena, New York, at 9 a.m. on a particular day in June.



What was the barometric pressure at Massena 3 hours earlier on that day?

- A) 1009.1 mb
- B) 997.1 mb
- C) 999.7 mb
- D) 1003.3 mb

- 248) Under which conditions is a cloud most likely to form at the Earth's surface?

- A) The air temperature and air pressure are stable, and condensation nuclei are scarce.
- B) The air temperature is at the dewpoint, and condensation nuclei are abundant.
- C) The air temperature is above the dewpoint, and no condensation nuclei are present.
- D) The relative humidity is zero, and condensation nuclei are abundant.

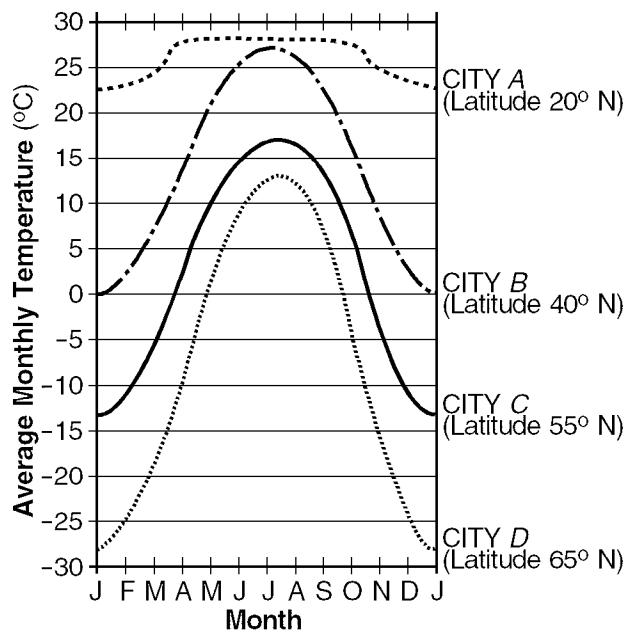
- 249) In the middle latitudes of the Southern Hemisphere, the warmest month is usually

- A) October
- B) February
- C) April
- D) July

- 250) What is the dewpoint when the dry-bulb temperature is 24°C and the wet-bulb temperature is 15°C?
- A) -18°C C) 36°C
 B) 8°C D) 4°C
- 251) What is the dewpoint temperature when the dry-bulb temperature is 16°C and the wet-bulb temperature is 11°C?
- A) 9°C C) -17°C
 B) 7°C D) 5°C
- 252) Two coastal cities have the same latitude and elevation, but are located near different oceans. Which statement best explains why the two cities have different climates?
- A) They are at different longitudes.
 B) They are near different ocean currents.
 C) They have different angles of insolation.
 D) They have different numbers of daylight hours.

Questions 253 through 255 refer to the following:

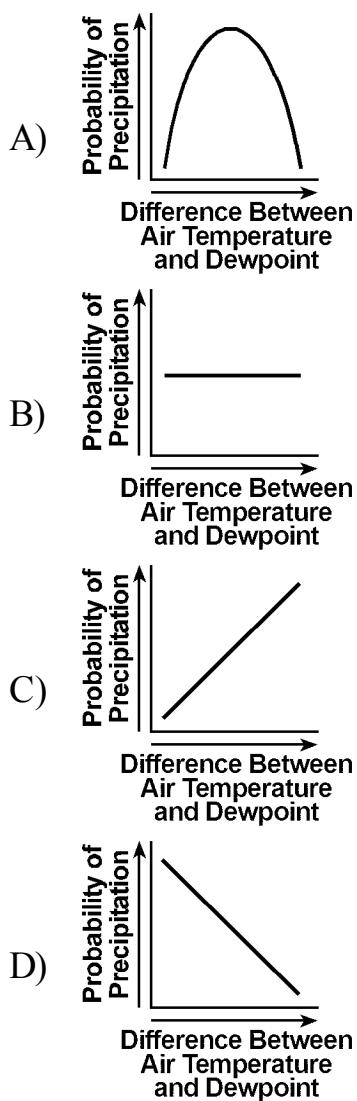
The graph below shows the average monthly temperatures at cities A, B, C, and D. The latitude of each city is also indicated.



- 253) Which city has the *greatest* temperature range?
- A) A C) C
 B) B D) D
- 254) Which city is located *closest* to the Equator?
- A) A C) C
 B) B D) D
- 255) What is the average temperature in March for city C?
- A) -5°C C) -2°C
 B) 0°C D) 7°C

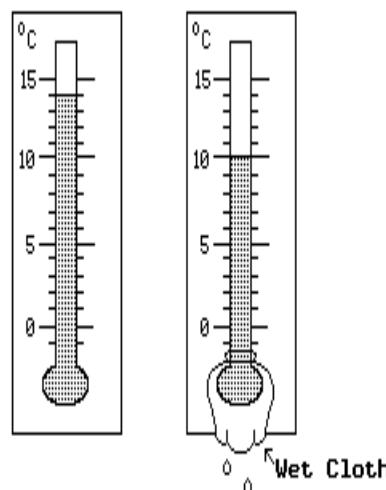
- 256) On a July afternoon in New York State, the barometric pressure is 29.85 inches and falling. This reading most likely indicates
- an approaching storm
 - gradually improving conditions
 - rapidly clearing skies
 - continuing fair weather
- 257) As the difference between the dewpoint temperature and the air temperature decreases, the probability of precipitation
- decreases
 - remains the same
 - increases
- 258) Which two changes increase the rate of evaporation of water into the atmosphere?
- decreasing air pressure and increasing cloud cover
 - increasing relative humidity and decreasing dewpoint temperature
 - decreasing air temperature and increasing surface area
 - increasing air temperature and increasing wind velocity
- 259) Two cities are located at the same latitude and elevation. One city, located in the center of the United States, has cooler winters and warmer summers than the other city, which is located near the coast. Which statement best explains these seasonal differences?
- A large body of water modifies coastal air temperatures.
 - Warm ocean currents flow among most coastlines.
 - Cold airmasses usually originate over continents.
 - The air over continents is drier than the air over oceans.
- 260) An airmass originating over the North Pacific Ocean would most likely be
- continental polar
 - maritime polar
 - maritime tropical
 - continental tropical
- 261) The diagram below shows the direction of movement of air over a mountain.
-
- As the air moves down the leeward side of the mountain, the air will
- cool due to expansion
 - cool due to compression
 - warm due to compression
 - warm due to expansion

- 262) Which graph best shows the relationship between the probability of precipitation and the difference between air temperature and dewpoint?



- 263) A higher concentration of water vapor is found in the atmosphere over New York State in the summer than in the winter because in the summer there is a greater
- concentration of air pollutants
 - rate of evapotranspiration
 - amount of water in ground storage
 - frequency of high pressure

- 264) The two thermometers below show the dry-bulb and wet-bulb temperatures of the air.

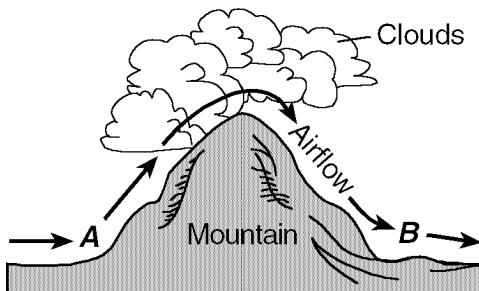


According to the dewpoint temperature chart in the *Earth Science Reference Tables*, what is the approximate dewpoint temperature of the air?

- 25DC
- 6DC
- 11DC
- 4DC

Questions 265 and 266 refer to the following:

In the diagram of the mountain below, the arrows represent the direction of airflow over the mountain.



- 265) Compared to the temperature and humidity conditions at location *A*, the conditions at location *B* are

 - A) cooler and less humid
 - B) warmer and more humid
 - C) warmer and less humid
 - D) cooler and more humid

266) As the air moves up the windward side of the mountain shown, the air

 - A) compresses and cools
 - B) expands and cools
 - C) compresses and warms
 - D) expands and warms

267) Liquid water will continue to evaporate from the Earth's surface, increasing the amount of atmospheric water vapor, until

 - A) the relative humidity falls below 50%
 - B) transpiration occurs
 - C) the atmosphere becomes saturated
 - D) the temperature of the atmosphere becomes greater than the dewpoint temperature

268) In the diagram below, at which location would the vapor pressure of the air most likely be *greatest*?

269) If the air temperature decreases, the saturated vapor pressure will

 - A) remain the same
 - B) decrease
 - C) increase

270) What is the approximate dewpoint temperature when the dry-bulb temperature is 24DC and the wet-bulb temperature is 18DC?

 - A) 6DC
 - B) 17DC
 - C) 14DC
 - D) 12DC

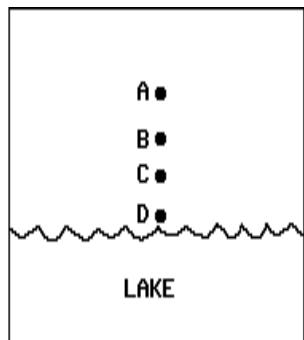
271) Which process most directly results in cloud formation?

 - A) condensation
 - B) radiation
 - C) precipitation
 - D) transpiration

Questions 272 and 273 refer to the following:

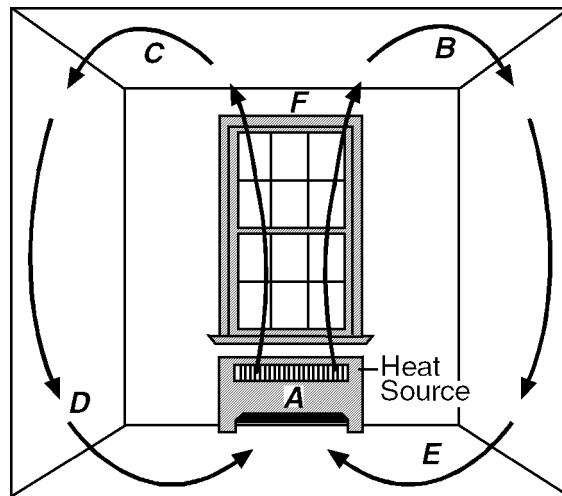
The diagram below shows the pattern of air movement within a closed room.

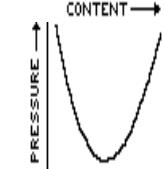
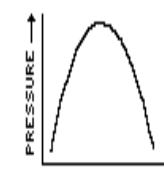
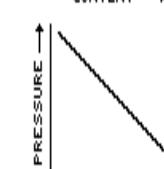
The diagram illustrates the flow of air within a rectangular room. Air enters through a window labeled *F* at the bottom center. It rises along the left wall, indicated by an upward-pointing arrow above the wall, and exits through a curved arrow labeled *C* near the ceiling. Simultaneously, air enters through a curved arrow labeled *B* near the ceiling and descends along the right wall, indicated by a downward-pointing arrow below the wall, finally exiting through a window at the bottom right. Arrows also point outwards from the top and bottom edges of the room walls.



Questions 272 and 273 refer to the following:

The diagram below shows the pattern of air movement within a closed room.



- 273) The temperature of the radiator is 65DC. What is the equivalent Fahrenheit temperature?
- A) 149DF C) 126DF
 B) 144DF D) 132DF
- 274) According to the *Earth Science Reference Tables*, an air pressure of 30.21 inches of mercury is equal to approximately
- A) 1,023 mb C) 1,015 mb
 B) 1,020 mb D) 1,017 mb
- 275) Moisture is evaporating from a lake into stationary air at a constant temperature. As more moisture is added to this air, the rate at which water will evaporate will probably
- A) remain the same
 B) increase
 C) decrease
- 276) A city located near the center of a large continent has colder winters and warmer summers than a city at the same elevation and latitude located on the continent's coast. Which statement *best* explains the difference between the cities' climates?
- A) Land has a lower specific heat than water.
 B) Air masses originate only over land.
 C) Water changes temperature more rapidly than land.
 D) Windspeeds are greater over land than over oceans.
- 277) Wind moves from regions of
- A) high precipitation toward regions of low precipitation
 B) high humidity toward regions of low humidity
 C) high temperature toward regions of low temperature
 D) high pressure toward regions of low pressure
- 278) Which event usually occurs when air is cooled to its dewpoint temperature?
- A) condensation
 B) freezing
 C) evaporation
 D) transpiration
- 279) Which graph best shows the relationship between atmospheric pressure and water vapor content at the Earth's surface?
- A) 
 B) 
 C) 
 D) 

280) When a person leaves the ocean after swimming on a windy day, the person usually feels cold because

- A) water evaporates from the skin
- B) salt is absorbed through the skin
- C) water condenses on the skin
- D) radiation is absorbed through the skin

281) The change from the vapor phase to the liquid phase is called

- A) transpiration
- B) condensation
- C) precipitation
- D) evaporation

282) An Earth science class is preparing a booklet on emergency preparedness. State *one* safety measure that should be taken to minimize danger from each of the following threats:

- (1) thunderstorm
- (2) tornado
- (3) volcanic eruption

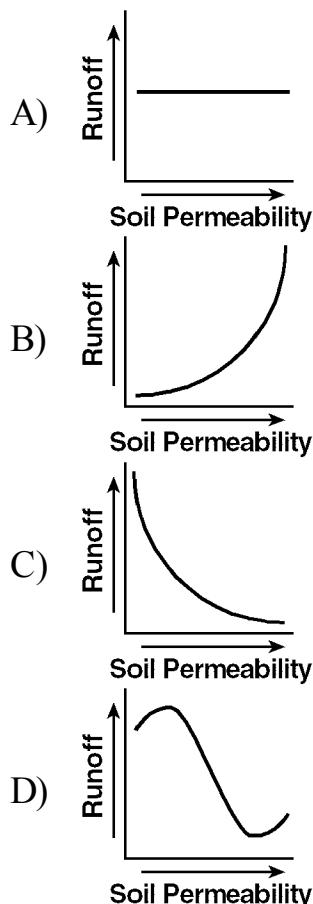
283) The direction of surface ocean currents is influenced most by

- A) planetary winds
- B) variations in salinity of the water
- C) variations in density of the water
- D) land breezes and sea breezes

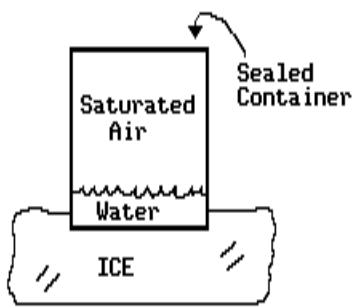
284) A high air-pressure, dry-climate belt is located at which Earth latitude?

- | | |
|---------|---------|
| A) 60°N | C) 30°N |
| B) 0° | D) 15°N |

285) Which graph shows the effect of soil permeability on the amount of runoff in an area?



- 286) The diagram below shows a sealed container holding liquid water and clean air saturated with water vapor. (Relative humidity is 100%) The container has been placed on a block of ice to cool.



Which statement best explains why a cloud has *not* formed in the sealed container?

- A) The air in the container is above the freezing point.
- B) The air in the container lacks condensation nuclei.
- C) The water in the container is still evaporating.
- D) The ice is cooling the water in the container.

- 287) The map below indicates four locations *A*, *B*, *C*, and *D* which have the same elevation and latitude. Which location would most likely experience the *smallest* range of annual temperature?



- A) *D*
- B) *C*
- C) *B*
- D) *A*

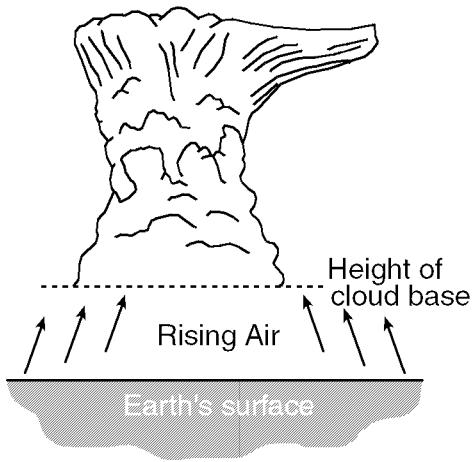
- 288) What effect does a large body of water usually have on the climate of a nearby landmass?

- A) The water causes cooler summers and warmer winters.
- B) The water causes hotter summers and warmer winters.
- C) The water causes cooler summers and colder winters.
- D) The water causes hotter summers and colder winters.

- 289) Which set of conditions would produce the *most* runoff of precipitation?

- A) steep slope and permeable surface
- B) gentle slope and permeable surface
- C) steep slope and impermeable surface
- D) gentle slope and impermeable surface

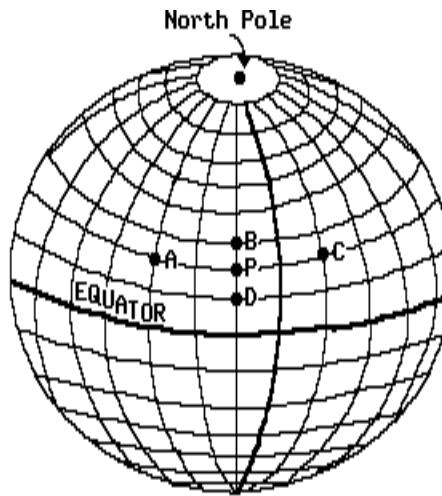
- 290) The diagram below shows air rising from the Earth's surface to form a thunderstorm cloud.



According to the Lapse Rate chart, what is the height of the base of the thunderstorm cloud when the air at the Earth's surface has a temperature of 30°C and a dewpoint of 22°C?

- | | |
|-----------|-----------|
| A) 3.0 km | C) 1.0 km |
| B) 0.7 km | D) 1.5 km |

- 291) The diagram below represents several locations on the surface of the Earth. Each location is at sea level and is surrounded by ocean water.



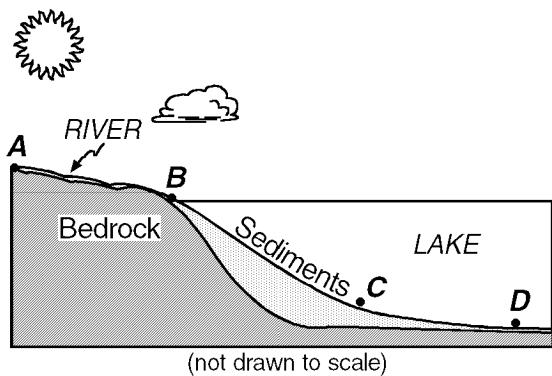
The average annual air temperature at point P is most likely higher than the average annual air temperature at point

- | | |
|------|------|
| A) B | C) C |
| B) A | D) D |

- 292) A temperature of 104°F is approximately equal to

- | | |
|----------|----------|
| A) 40°C | C) 214°C |
| B) 220°C | D) 43°C |

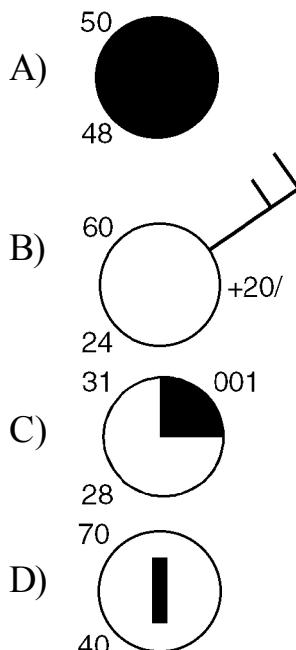
- 293) The diagram below represents a river flowing into a large lake on a hot, sunny afternoon in July in New York State. The river is carrying particles ranging in size from cobbles to clay.



Because of air temperature differences over the land and water, what is most likely the direction of air movement on this July afternoon?

- A) sinking over the land
- B) blowing from the shore toward the lake
- C) rising over the lake
- D) blowing from the lake toward the land

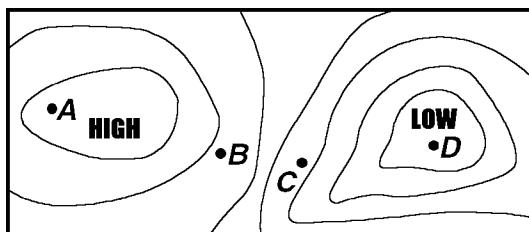
- 294) Which weather station model represents the location with the *greatest* probability of precipitation?



- 295) The Canaries Current along the west coast of Africa and the Peru Current along the west coast of South America are *both*

- A) cool currents that flow toward the Equator
- B) cool currents that flow away from the Equator
- C) warm currents that flow away from the Equator
- D) warm currents that flow toward the Equator

- 296) The diagram below represents a section of a weather map showing high- and low-pressure systems. The lines represent isobars.



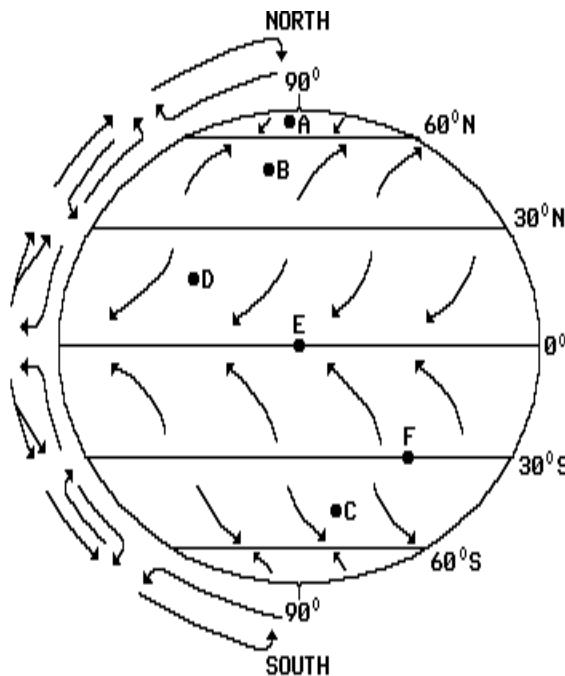
At which point is the windspeed greatest?

- 297) Which conditions are most likely to develop over a land area next to an ocean during a hot, sunny afternoon?

 - A) The air pressure over the land is lower than the air pressure over the ocean, and a breeze blows from the ocean.
 - B) The air temperature over the land is lower than the air temperature over the ocean, and a breeze blows from the land.
 - C) The air pressure over the land is higher than the air pressure over the ocean, and a breeze blows from the ocean.
 - D) The air temperature over the land is higher than the air temperature over the ocean, and a breeze blows from the land.

Questions 298 and 299 refer to the following:

The diagram below represents the general circulation of the Earth's atmosphere and the Earth's planetary wind and pressure belts. Points *A* through *F* represent locations on the Earth's surface.



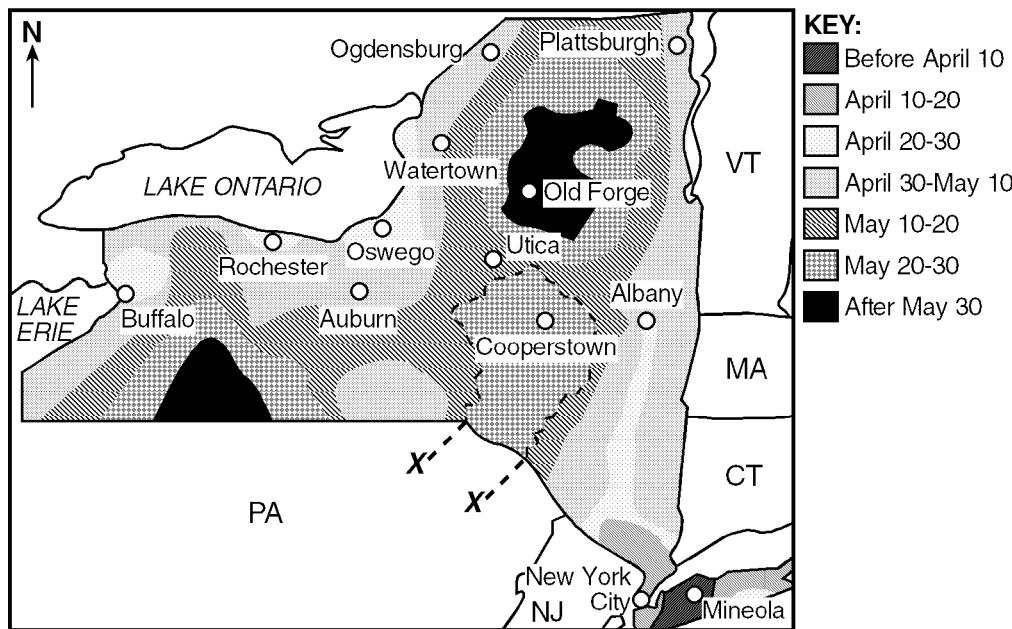
- 298) Which location is experiencing a southwest planetary wind?

- 299) Which location is near the center of a low-pressure belt where daily rains are common?

- 300) Condensation of water vapor in the atmosphere is most likely to occur when a condensation surface is available and

- A) the temperature of the air is below 0°C
- B) the air is saturated with water vapor
- C) the air pressure is rising
- D) a strong wind is blowing

- 301) The map below shows the average date of the last freezing temperatures in the spring at locations in New York State.



Why is the date of the last spring freeze earlier for Oswego than for Auburn?

- A) Auburn has a longer duration of insolation in the spring.
- B) Auburn is at a lower latitude.
- C) Oswego is at a higher altitude.
- D) Oswego is exposed to moderating air from Lake Ontario.

- 302) The table below shows dry-bulb and wet-bulb temperature readings taken at four different locations, *A*, *B*, *C*, and *D*.

Location	Dry-Bulb Temperature (°C)	Wet-Bulb Temperature (°C)
<i>A</i>	13	9
<i>B</i>	18	15
<i>C</i>	23	21
<i>D</i>	28	27

Which location has the *lowest* relative humidity? [Refer to the *Earth Science Reference Tables*.]

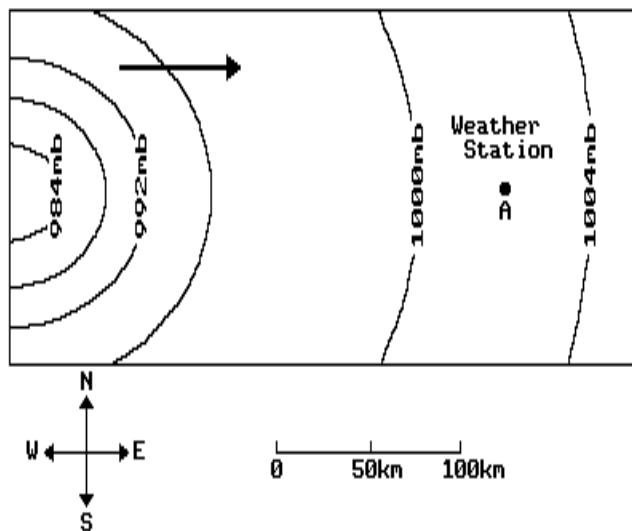
- A) *A* B) *B* C) *C* D) *D*
- 303) The table below shows weather conditions for 4 consecutive days at a location in New York State. Each reading was taken at 1 p.m.

Day	Temperature (°F)	Wind Speed, Wind Direction, Cloud Cover	Barometric Pressure (mb)	Present Weather
Monday	6		1,028.0	Clear
Tuesday	4		1,029.0	Sunny
Wednesday	24		1,017.0	Light snow
Thursday	26		1,011.0	Light snow

If the weather trend continues, the most probable air temperature for 1 p.m. on Friday is

- A) 4DF B) 36DF C) 20DF D) 28DF

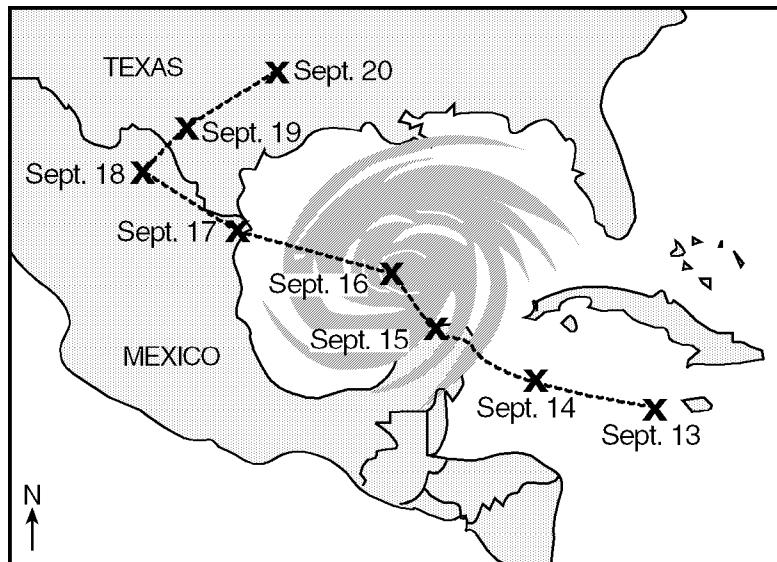
- 304) The diagram below represents weather station A in the path of an airmass approaching from the west. Which change will most likely be recorded first by weather station A?



- A) a decrease in cloud cover
 B) a decrease in temperature
 C) an increase in air pressure
 D) an increase in wind speed

Questions 305 and 306 refer to the following:

The map below represents a satellite image of Hurricane Gilbert in the Gulf of Mexico. Each X represents the position of the center of the storm on the date indicated.

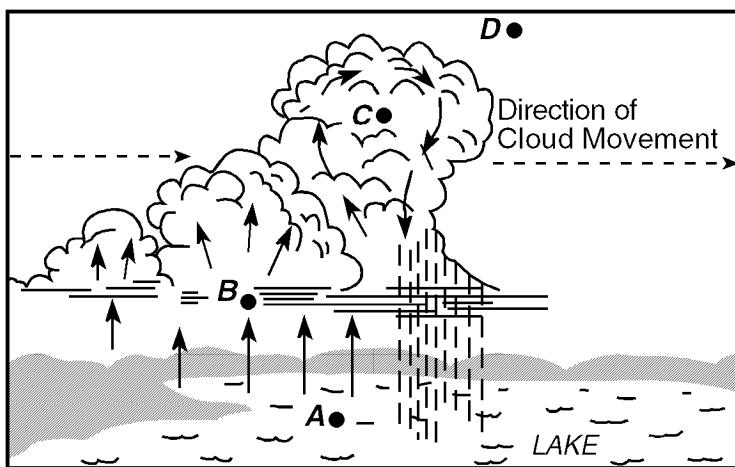


- 305) Describe *one* threat to human life and property that could have been caused by the arrival of Hurricane Gilbert along the coastline at the Texas-Mexico border in the given map.

- 306) State *one* reason Hurricane Gilbert weakened between September 16 and September 18 in the given map.

Questions 307 through 309 refer to the following:

The diagram below shows air movements associated with cumulus cloud formation over a lake during a summer day. A, B, C, and D are reference points.

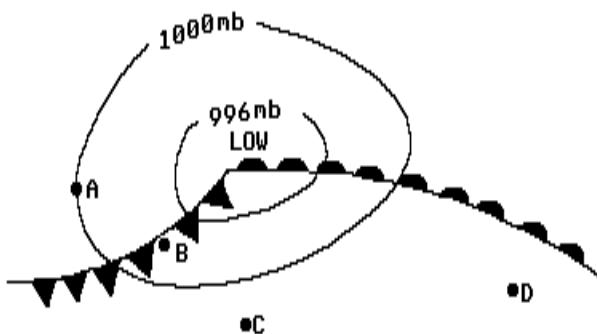


- 307) Air rises from point A toward point B and forms clouds mainly because the air at point A has a
- warm temperature and high water-vapor content
 - cool temperature and high water-vapor content
 - cool temperature and low water-vapor content
 - warm temperature and low water-vapor content

- 308) At which point does the air temperature first reach the dewpoint?
- A
 - B
 - C
 - D

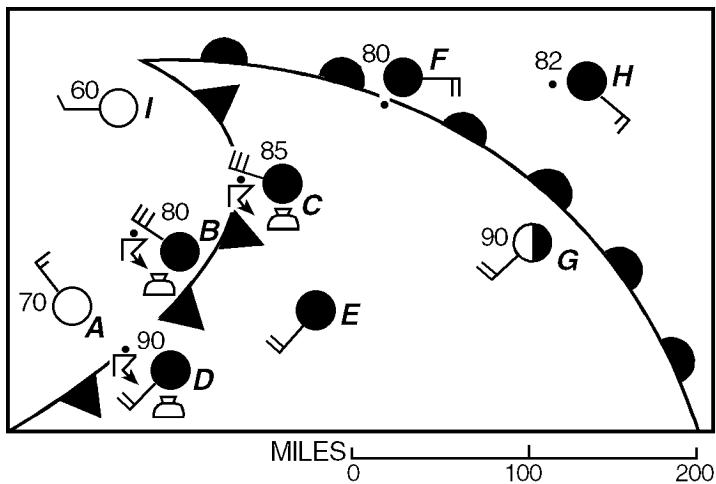
- 309) As the air rises past point C, the temperature of the air will
- decrease as its volume increases
 - decrease as its volume decreases
 - increase as its volume decreases
 - increase as its volume increases

- 310) Cities *A*, *B*, *C*, and *D* on the weather map below are affected by a low pressure system (cyclone).



Which city would have the most unstable atmospheric conditions and the *greatest* chance of precipitation?

- A) *C* B) *B* C) *A* D) *D*
- 311) The weather map below shows a low-pressure system over the eastern part of the United States. Weather data is given for cities *A* through *I*. The temperature at city *E* has been left blank.

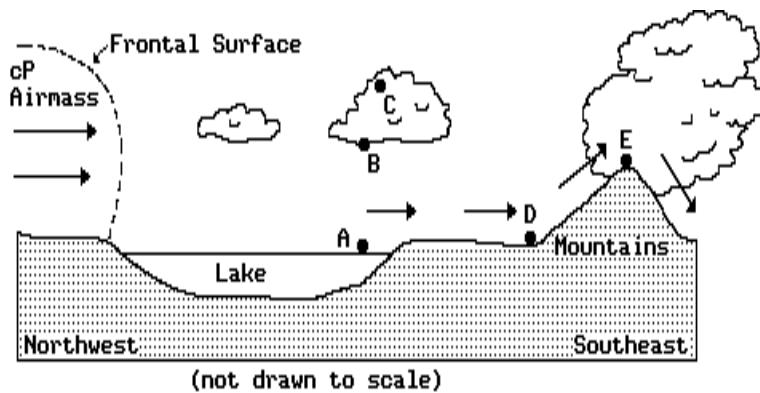


What is the most probable temperature for city *E*?

- A) 75DF B) 88DF C) 70DF D) 60DF

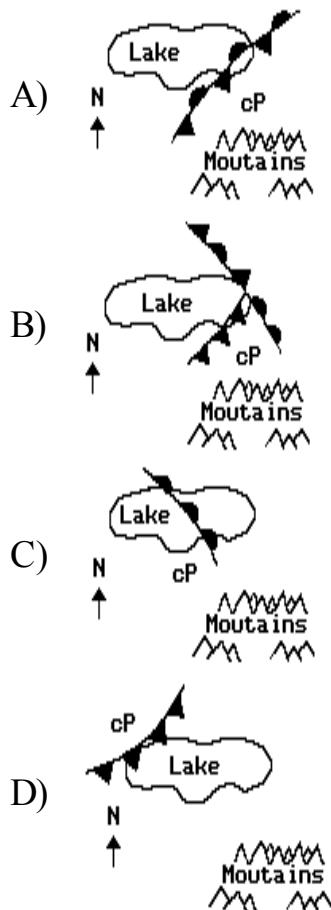
Questions 312 through 314 refer to the following:

The diagram below shows a common weather condition approaching a section of New York State.



- 312) As the air moves from point D to point E, it will be
- cooled by compression
 - cooled by expansion
 - warmed by expansion
 - warmed by compression

- 313) Which surface weather map below best represents the frontal system shown in the diagram?



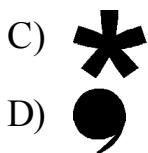
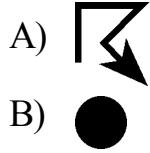
- 314) Which geographic area is the source of the cP airmass shown in the diagram?
- Caribbean Sea
 - southwestern United States
 - North Atlantic Ocean
 - central Canada

Questions 315 and 316 refer to the following:

The table below shows weather conditions for 4 consecutive days at a location in New York State. Each reading was taken at 1 p.m.

Day	Temperature (°F)	Wind Speed, Wind Direction, Cloud Cover	Barometric Pressure (mb)	Present Weather
Monday	6	—○—	1,028.0	Clear
Tuesday	4	—○—	1,029.0	Sunny
Wednesday	24	●—○—	1,017.0	Light snow
Thursday	26	●—○—	1,011.0	Light snow

- 315) Which symbol *best* indicates the weather conditions at 1 p.m. on Wednesday?

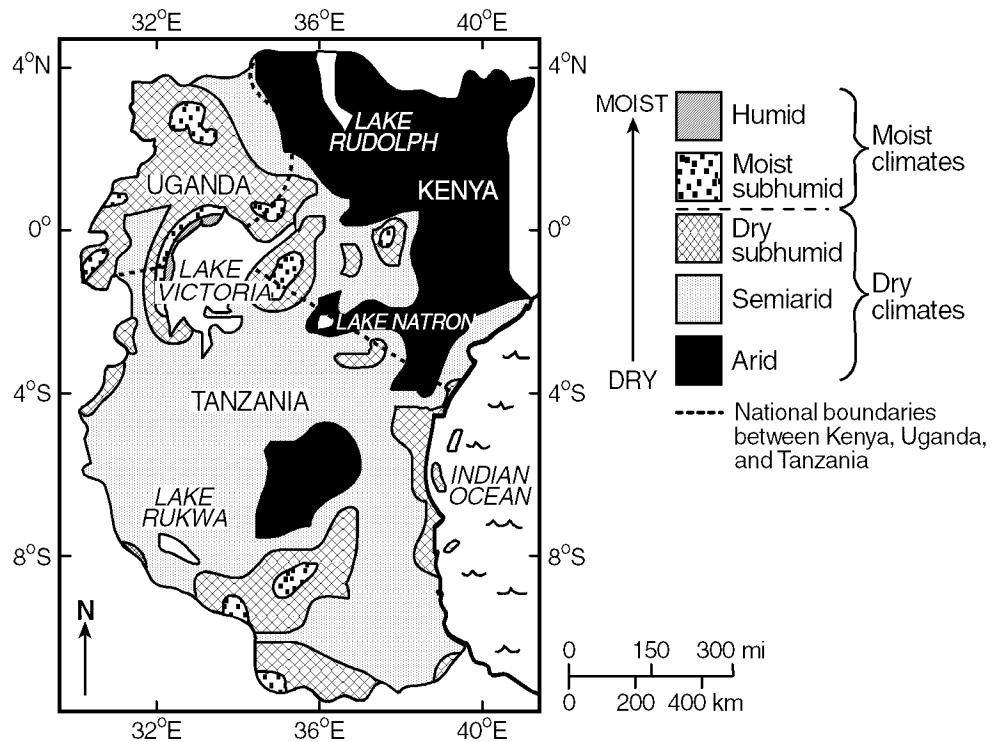


- 316) On which day was the wind speed at 1 p.m. the *greatest*?

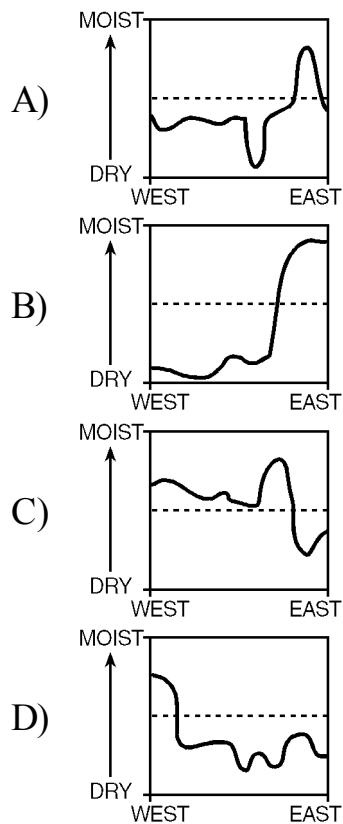
- Wednesday
- Thursday
- Monday
- Tuesday

Questions 317 through 321 refer to the following:

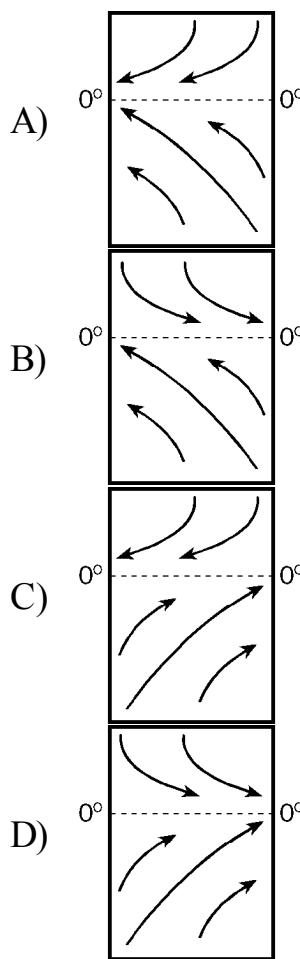
The map below shows the climate classifications of some countries in eastern Africa.



- 317) Which graph *best* represents the climate classifications across Tanzania from west to east at 5° South latitude?



- 318) Which pattern represents the general surface planetary winds during March in this region?



- 319) Which body of water appears to produce the *greatest* increase in the climate humidity of the adjacent land areas?

- A) Indian Ocean
- B) Lake Rudolph
- C) Lake Victoria
- D) Lake Rukwa

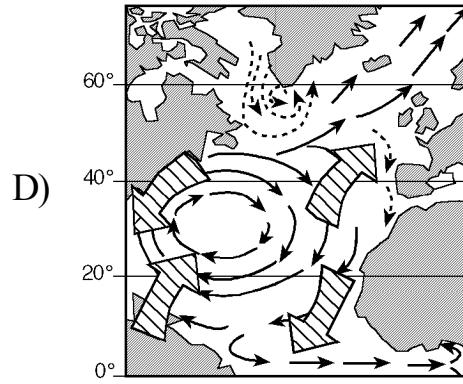
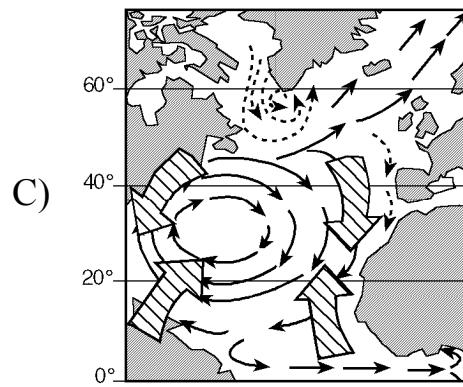
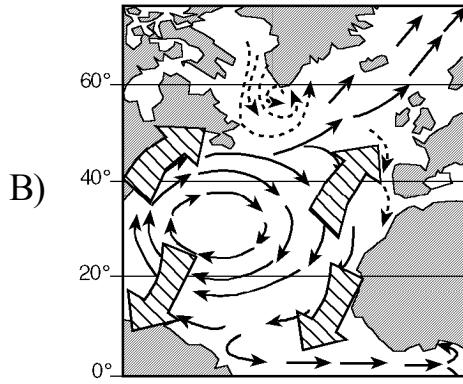
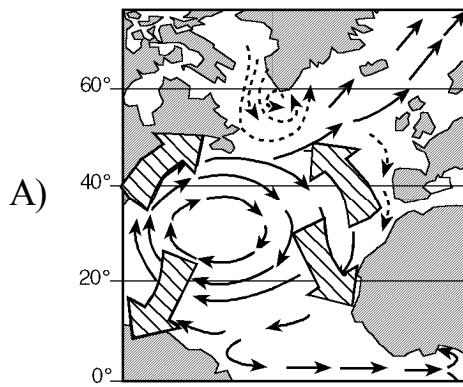
- 320) Climate classification systems such as this one are usually determined by comparing precipitation with
- A) potential evapotranspiration
 - B) elevation
 - C) duration of insolation
 - D) condensation

- 321) Which inference *best* explains the cause of the climate of the northeastern section of Kenya?
- Warm ocean currents bring moisture to this coastal section.
 - Mountains force air to rise over this section.
 - Cloud cover reflects most insolation in this section.
 - The air reaching this section comes from a dry landmass region.

- 322) Which map *best* represents the global prevailing surface wind patterns responsible for generating Atlantic Ocean currents?

KEY:

Direction of global winds Direction of ocean currents

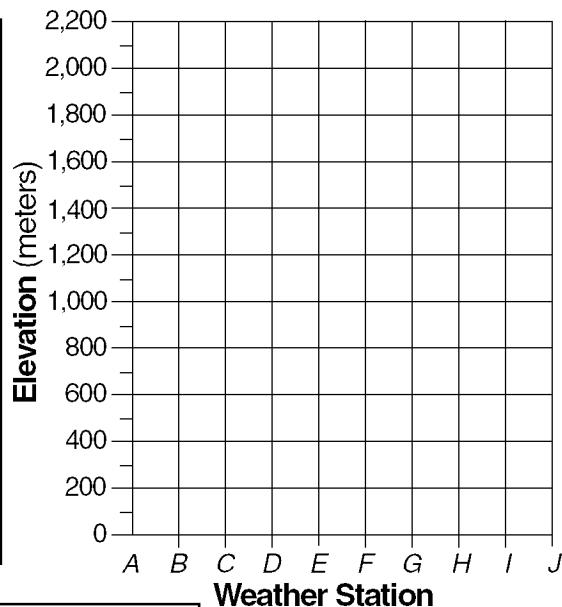


Questions 323 through 325 refer to the following:

The data table below shows the elevation and average annual precipitation at ten weather stations, *A* through *J*, located along a highway that passes over a mountain.

DATA TABLE

Weather Station	Elevation (m)	Average Annual Precipitation (cm)
<i>A</i>	1,350	20
<i>B</i>	1,400	24
<i>C</i>	1,500	50
<i>D</i>	1,740	90
<i>E</i>	2,200	170
<i>F</i>	1,500	140
<i>G</i>	800	122
<i>H</i>	420	60
<i>I</i>	300	40
<i>J</i>	0	65



SYMBOL CHART

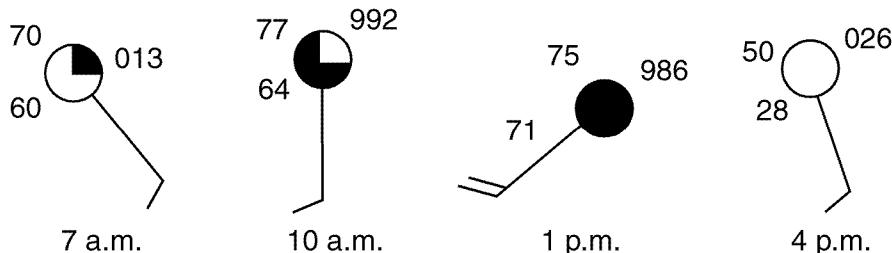
Key for Average Annual Precipitation			
▲ 0–25 cm	● 26–75 cm	◎ 76–127 cm	✗ 128–170 cm

- 323) Although stations *C* and *F* are at the same elevation, they have very different amounts of average annual precipitation. Explain how the prevailing wind direction might cause this difference.
- 324) State the relationship between the elevation of weather stations *A* through *E* and the average annual precipitation at these weather stations.

- 325) On the given grid, graph the data shown on the data table by following the directions below.
- Mark the grid with a point showing the elevation of each weather station.
 - Surround each point with the proper symbol from the symbol chart to show the amount of average annual precipitation for the weather station.

Questions 326 through 330 refer to the following:

The diagrams below represent station models showing weather data collected at four different times during 1 day at a location in New York State.



- 326) At which time of day was the *greatest* wind velocity recorded?

- A) 7 a.m. C) 4 p.m.
B) 1 p.m. D) 10 a.m.

- 327) What was the barometric pressure at 4 p.m.?

- A) 26.0 mb
B) 1,002.6 mb
C) 260 mb
D) 1,026 mb

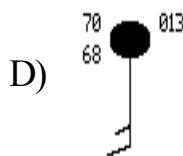
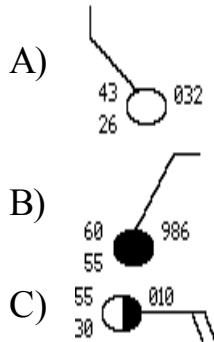
- 328) At what time was the probability of precipitation *greatest* at this location?

- A) 7 a.m. C) 4 p.m.
B) 1 p.m. D) 10 a.m.

- 329) The change in air temperature between 7 a.m. and 10 a.m. was most likely caused by

- A) an increase in the angle of insolation
B) the passage of a cold front
C) an increase in air pressure
D) a decrease in cloud cover

- 330) Which station model best represents the probable weather conditions at 7 p.m. if the present trend continues?



Questions 331 and 332 refer to the following:

A car was used to investigate the heat absorbed by the air inside a closed automobile. The car was completely closed and left out in the sunlight during the entire investigation. Assume that air can not move into or out of the car during the investigation.

The data table shows the outside air temperatures beneath the car, the air temperatures inside the passenger compartment, and the sky conditions during the investigation.

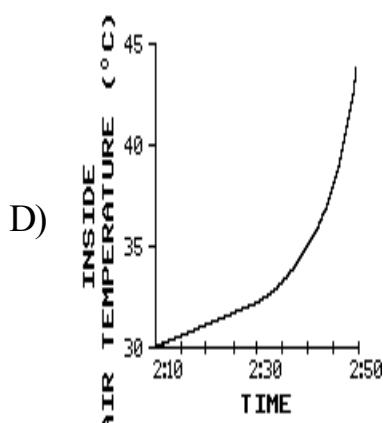
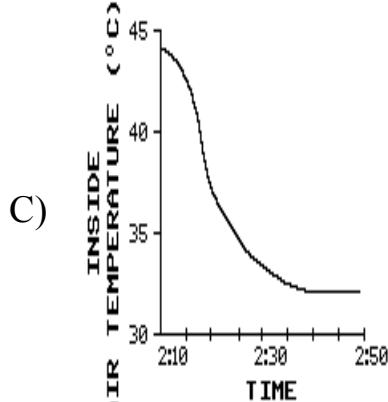
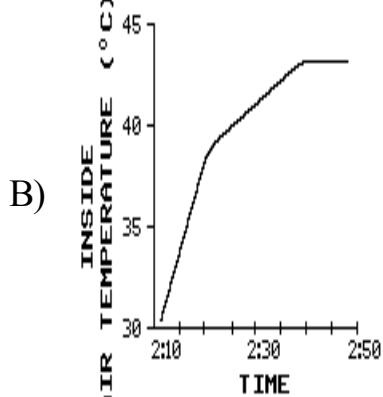
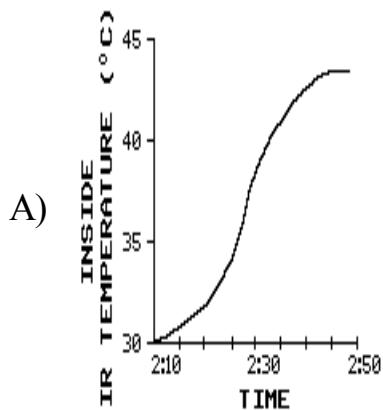
DATA TABLE

Clock Time (p.m.)	Air Temperature ($^{\circ}\text{C}$)		Sky Conditions
	outside	inside	
2:10	24	30	cloudy
2:15	24	33	cloudy
2:20	24	38	cloudy
2:25	24	40	cloudy
2:30	24	41	cloudy
2:35	24	42	sunny
2:40	24	43	cloudy
2:45	24	43	cloudy
2:50	24	43	cloudy

331) What was the rate at which the inside air temperature changed during the first five minutes of the investigation?

- A) 3.0 DC/min
- B) 0.3 DC/min
- C) 5.0 DC/min
- D) 0.6 DC/min

- 332) Which graph best represents the relationship between time and inside air temperature?



Questions 333 through 336 refer to the following:

The passage below represents a magazine article.

LAKE-EFFECT SNOW

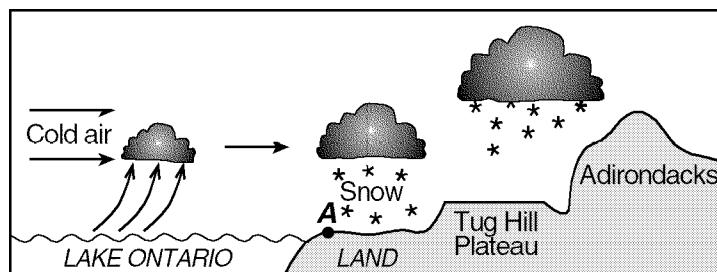
During the cold months of the year, the words "lake effect" are very much a part of the weather picture in many locations in New York State. Snow created by the lake effect may represent more than half the season's snowfall in some areas.

In order for heavy lake-effect snow to develop, the temperature of the water at the surface of the lake must be higher than the temperature of the air flowing over the water. The higher the water temperature and the lower the air temperature, the greater the potential for lake-effect snow.

A lake-effect storm begins when air flowing across the lake is warmed as it comes in close contact with the water. The warmed air rises and takes moisture along with it. This moisture, which is water vapor from the lake, is turned into clouds as it encounters much colder air above. When the clouds reach the shore of the lake, they deposit their snow on nearby land. A typical lake-effect storm is illustrated in the diagram below.

The area most likely to receive snow from a lake is called a "snowbelt." Lake Ontario's snowbelt includes the counties along the eastern and southeastern ends of the lake. Because the lake runs lengthwise from west to east, the prevailing westerly winds are able to gather the maximum amount of moisture as they flow across the entire length of the lake. There can be lake-effect snowfall anywhere around the lake, but the heaviest and most frequent snowfalls occur near the eastern shore.

In parts of the snowbelt, the lake effect combines with a phenomenon known as orographic lifting to produce some very heavy snowfalls. After cold air has streamed over the length of Lake Ontario, it moves inland and is forced to climb the slopes of the Tug Hill Plateau and the Adirondack Mountains, resulting in very heavy snowfall.



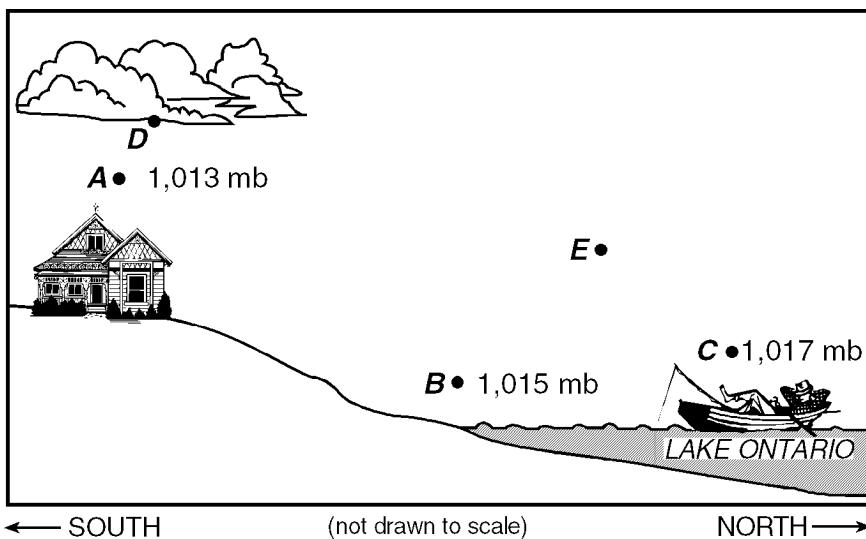
- 333) State the relationship that must exist between water temperature and air temperature for lake-effect snow to develop.

- 334) State the name of the New York State landscape region that includes location A shown in the given diagram.

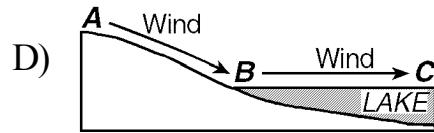
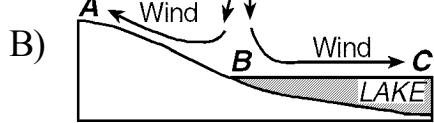
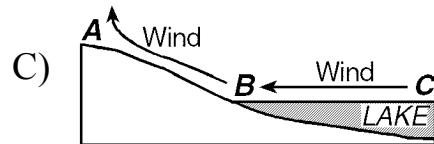
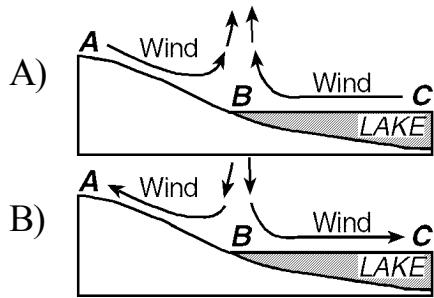
- 335) State why very heavy snowfall occurs in the Tug Hill Plateau region.

- 336) State why locations east and southeast of Lake Ontario are more likely to receive lake-effect snow than are locations west of the lake.

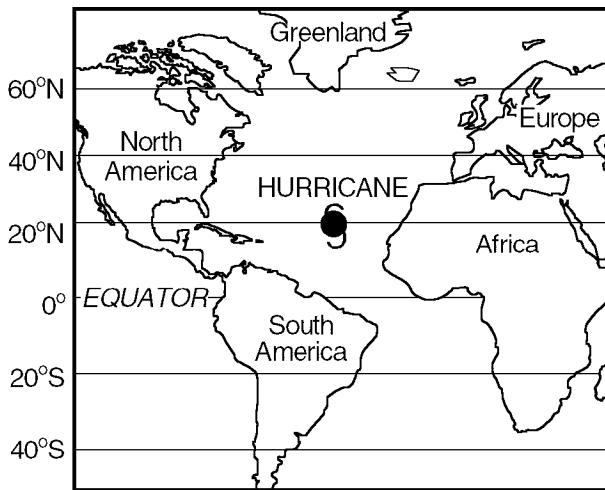
- 337) The diagram below shows a section of the shore of Lake Ontario. Surface air-pressure readings are shown for three of the locations.



Which diagram *best* shows the probable wind direction for the conditions shown?



- 338) The hurricane shown on the map below is following a normal storm track for the month of September.

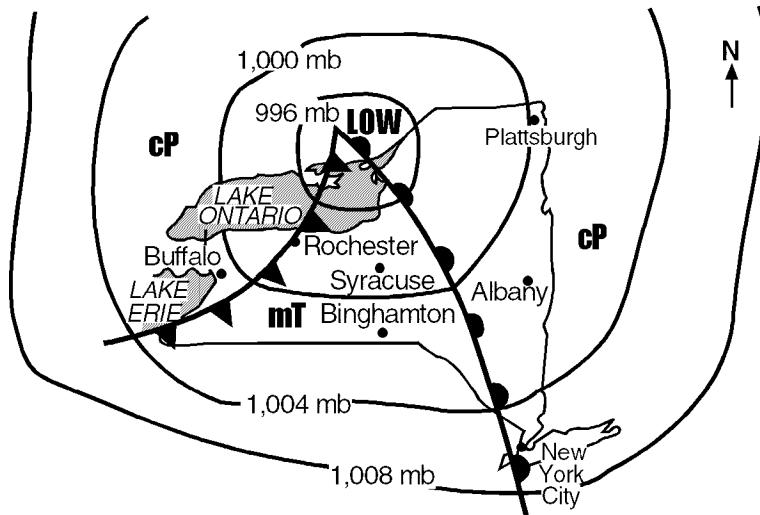


From the position shown on the map, toward which landmass is the hurricane most likely traveling?

- A) Africa
- B) South America
- C) Europe
- D) North America

Questions 339 and 340 refer to the following:

The weather map below shows a low-pressure storm system located over New York State in midsummer.



- 339) Most weather systems move across New York State from
- north to south
 - east to west
 - south to north
 - west to east

- 340) Low-pressure air masses (cyclones) over New York State usually appear on a series of satellite photographs as
- rings of clouds with a large, clear center
 - totally clear areas
 - straight lines of clouds
 - counterclockwise cloud swirls

Questions 341 through 343 refer to the following:

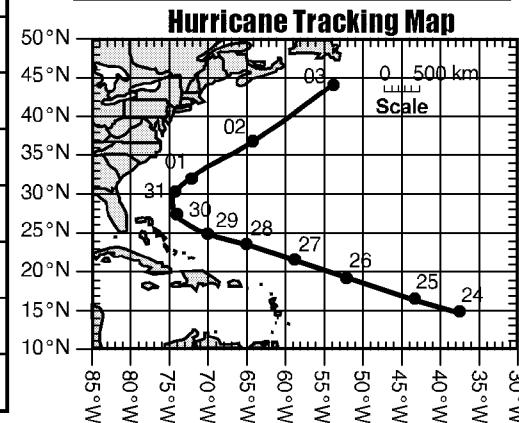
On the Hurricane Tracking Map below, Table I below represents the storm track data for an Atlantic hurricane. Location, wind velocity, air pressure, and storm strength are shown for the storm's center at 3 p.m. Greenwich time each day. Table II shows a scale of relative storm strength. The map shows the hurricane's path.

Data Table I

Latitude (°N)	Longitude (°W)	Date	Wind Velocity (knots)	Air Pressure (millibars)	Storm Strength
14	37	Aug. 24	30	1,006	Tropical depression
16	44	Aug. 25	70	987	Category-1 hurricane
19	52	Aug. 26	90	970	Category-2 hurricane
21	59	Aug. 27	80	997	Category-1 hurricane
23	65	Aug. 28	80	988	Category-1 hurricane
25	70	Aug. 29	80	988	Category-1 hurricane
27	73	Aug. 30	65	988	Category-1 hurricane
30	74	Aug. 31	85	976	Category-2 hurricane
32	72	Sept. 01	85	968	Category-2 hurricane
37	64	Sept. 02	70	975	Category-1 hurricane
44	53	Sept. 03	65	955	Category-1 hurricane

Data Table II

Storm Strength Scale	Relative Strength
Tropical depression	WEAKEST
Tropical storm	
Category 1	
Category 2	
Category 3	
Category 4	
Category 5	STRONGEST



- 341) Describe *two* characteristics of the circulation pattern of the surface winds around the center (eye) of a Northern Hemisphere low-pressure hurricane.
- 342) The hurricane did *not* continue moving toward the same compass direction during the entire period shown by the data table. Explain why the hurricane changed direction.

- 343) In the table below, calculate the average daily rate of movement of the hurricane during the period from 3 p.m. August 24 to 3 p.m. August 28. The hurricane traveled 2,600 kilometers during this 4-day period. [Follow the directions given below.]

a	rate of change =
b	rate of change =
c	rate of change =

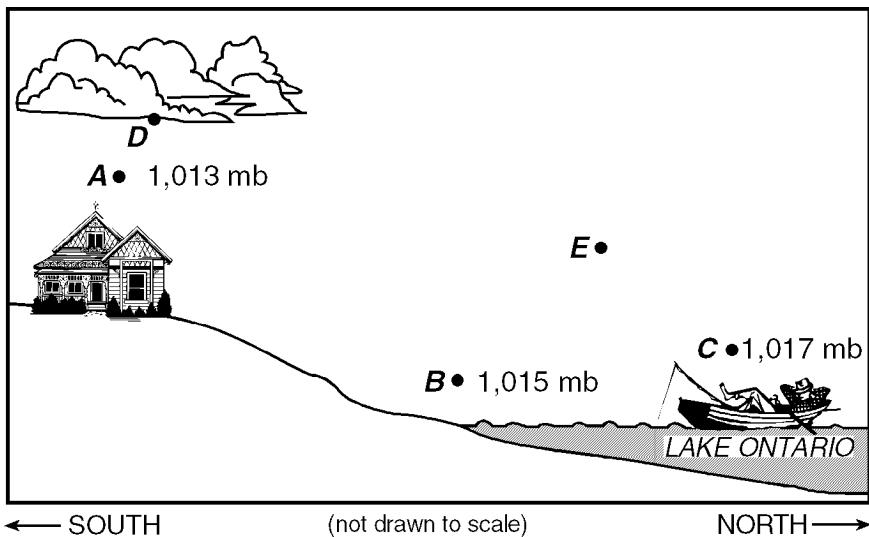
- (a) Write the equation used to determine the rate of change.
(b) Substitute data into the equation.
(c) Calculate the rate and label it with the proper units.

344) The data table below shows average daily air temperature, windspeed, and relative humidity for 4 days at a single location.

Day	Air Temperature (° F)	Windspeed (mph)	Relative Humidity (%)
Monday	40	15	60
Tuesday	65	10	75
Wednesday	80	20	30
Thursday	85	0	95

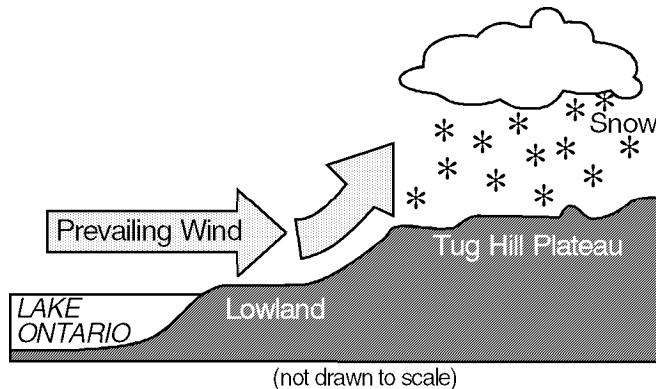
On which day was the air *closest* to being saturated with water vapor?

- 345) The diagram below shows a section of the shore of Lake Ontario. Surface air-pressure readings are shown for three of the locations.



When converted to inches of mercury, the air-pressure reading of 1,017 millibars at **C** is equal to

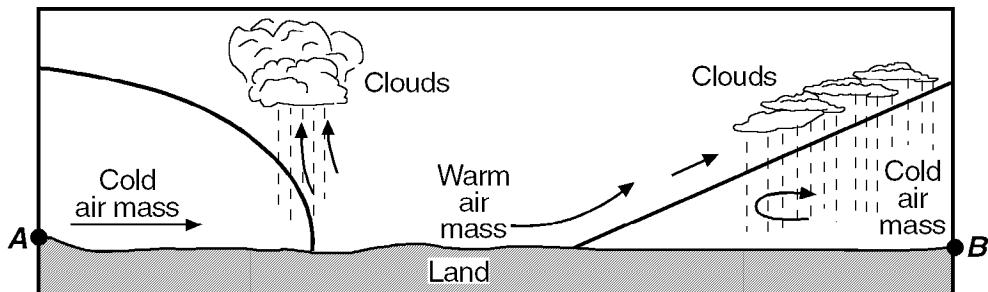
- A) 30.00 in B) 33.00 in C) 30.30 in D) 30.03 in
 346) The diagram below represents snow falling on the Tug Hill Plateau in New York State.



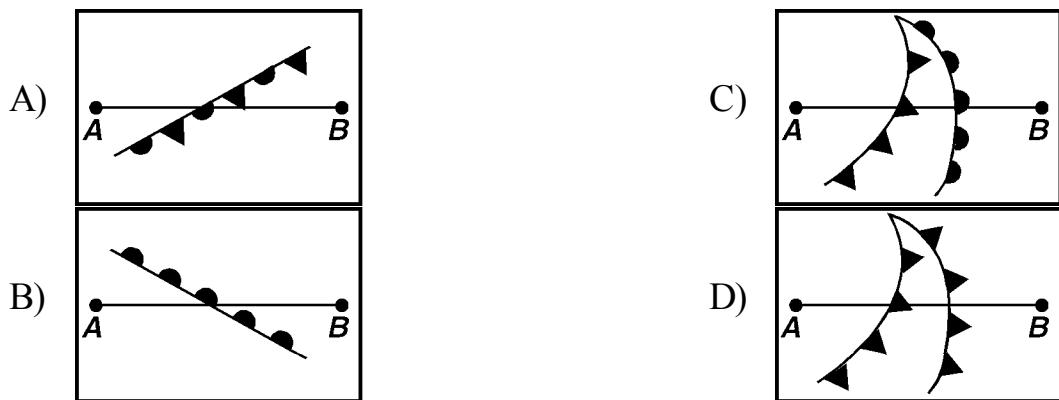
The *best* explanation for the formation of snow under these conditions is that

- A) dry air rises and warms C) moist air rises and warms
 B) dry air sinks and cools D) moist air rises and cools

- 347) The diagram below represents a cross section of air masses and frontal surface along line AB. The dashed lines represent precipitation.

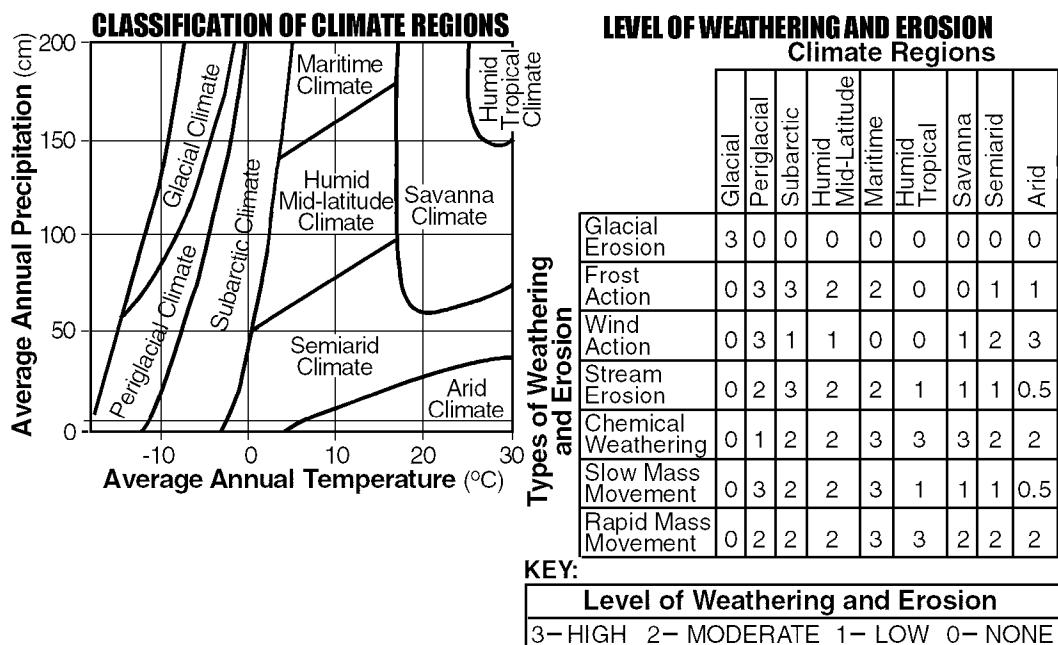


Which weather map *best* represents this frontal system?



Questions 348 through 350 refer to the following:

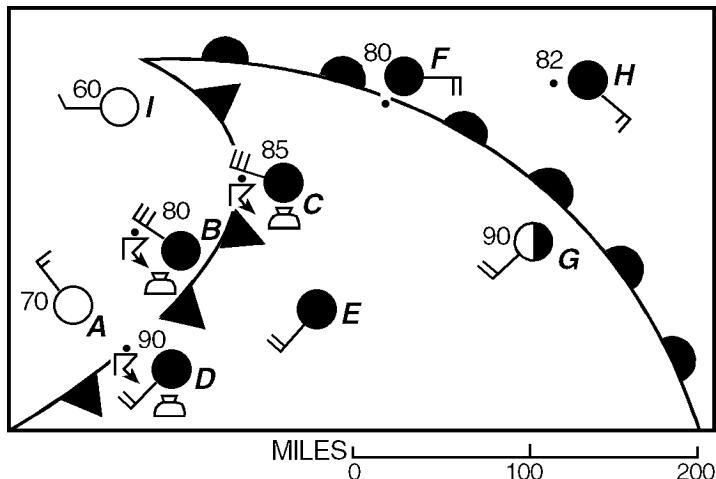
The graph below shows the classification of climate regions based on annual precipitation and annual temperature. The data table shows the level of weathering and erosion occurring within each climate region.



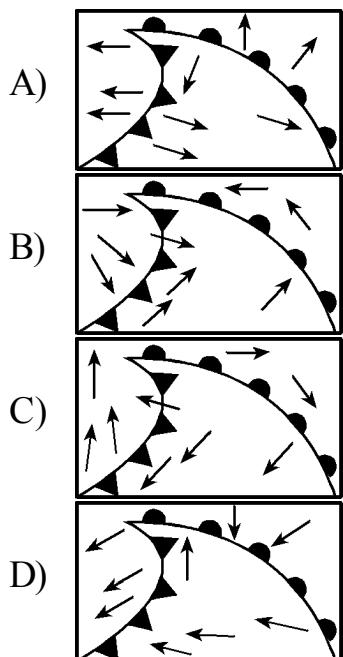
- 348) A savanna region is *best* described as having a
- warm climate that can be dry to very humid
 - cold climate that can be very dry to moderately humid
 - warm climate with constant arid conditions
 - cold climate with very humid conditions
- 349) Which climate region has an average annual temperature of 10DC and an average annual precipitation of 50 centimeters?
- arid
 - subarctic
 - maritime
 - semiarid
- 350) Compared to arid climates, *all* maritime climates are generally
- colder
 - warmer
 - more humid
 - less humid

Questions 351 through 353 refer to the following:

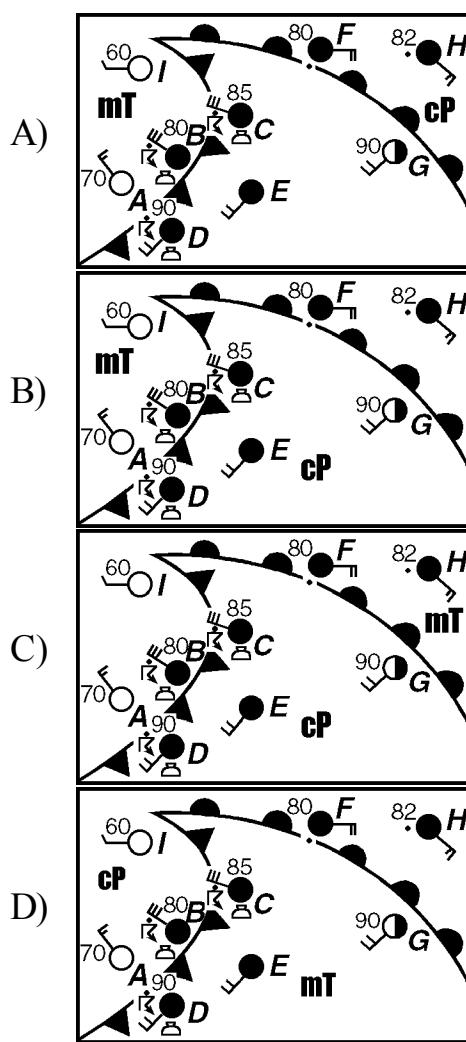
The weather map below shows a low-pressure system over the eastern part of the United States. Weather data is given for cities *A* through *I*. The temperature at city *E* has been left blank.



- 351) Which map correctly shows arrows indicating the surface wind pattern?



- 352) Which map correctly shows the locations of the **cP** and **mT** air-mass labels?

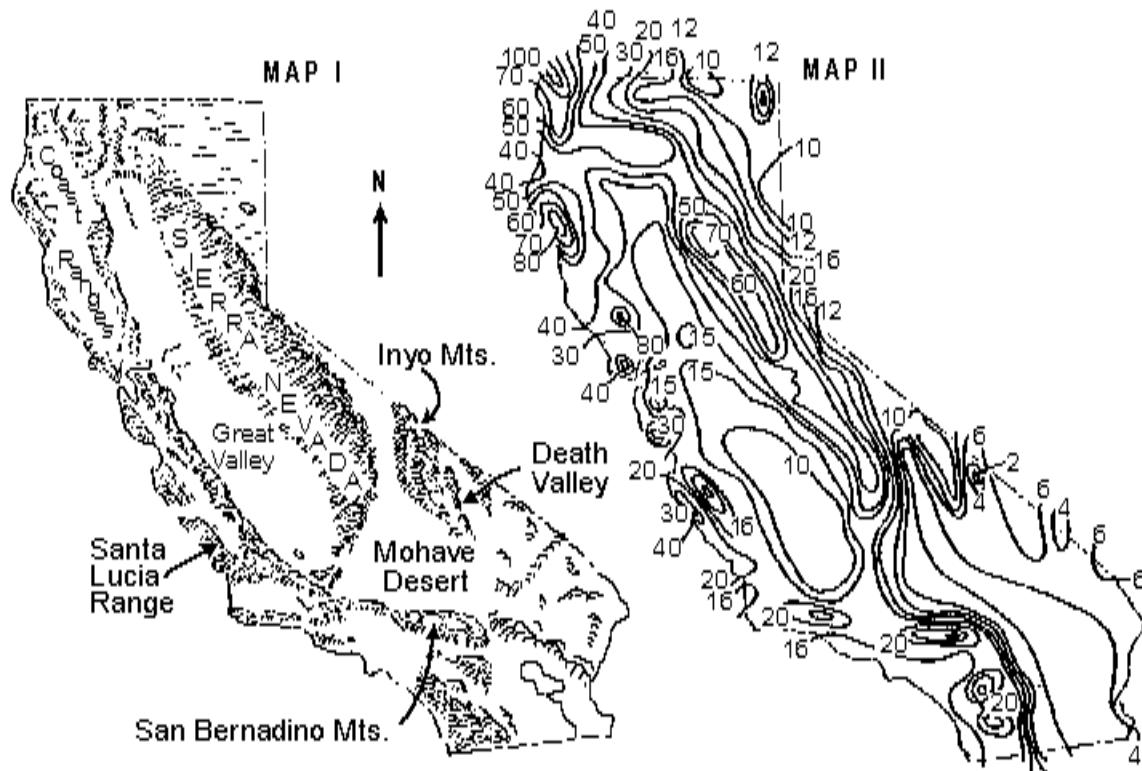


- 353) Which city is *least* likely to have precipitation in the next few hours?

- | | |
|------|------|
| A) C | C) F |
| B) H | D) A |

Questions 354 and 355 refer to the following:

The maps below represent California. "Landscape Areas" are shown on map I, and "Yearly Average Rainfall in Inches" is shown on map II. (Isoline intervals vary.)



- 354) What is the approximate total amount of rainfall each year, in inches, in the southern part of the Great Valley?
- between 15 and 20
 - less than 15
 - between 20 and 30
 - more than 30

- 355) Why are rainfall amounts greater in some regions of California than in others?

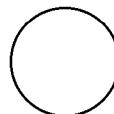
- Areas closer to the Equator receive more rainfall.
- More evaporation occurs in rainy areas.
- Moist air is cooled as it rises and moves over mountains.
- Desert regions produce condensation nuclei for cloud formation.

356) The following weather data was collected at a location in the eastern United States.

DATA TABLE

Air temperature	65°F
Dewpoint	64°F
Visibility	2 miles
Present weather	drizzle
Wind direction	from the west
Wind speed	5 knots
Amount of cloud cover	100%
Barometric pressure	996.2 millibars

STATION MODEL

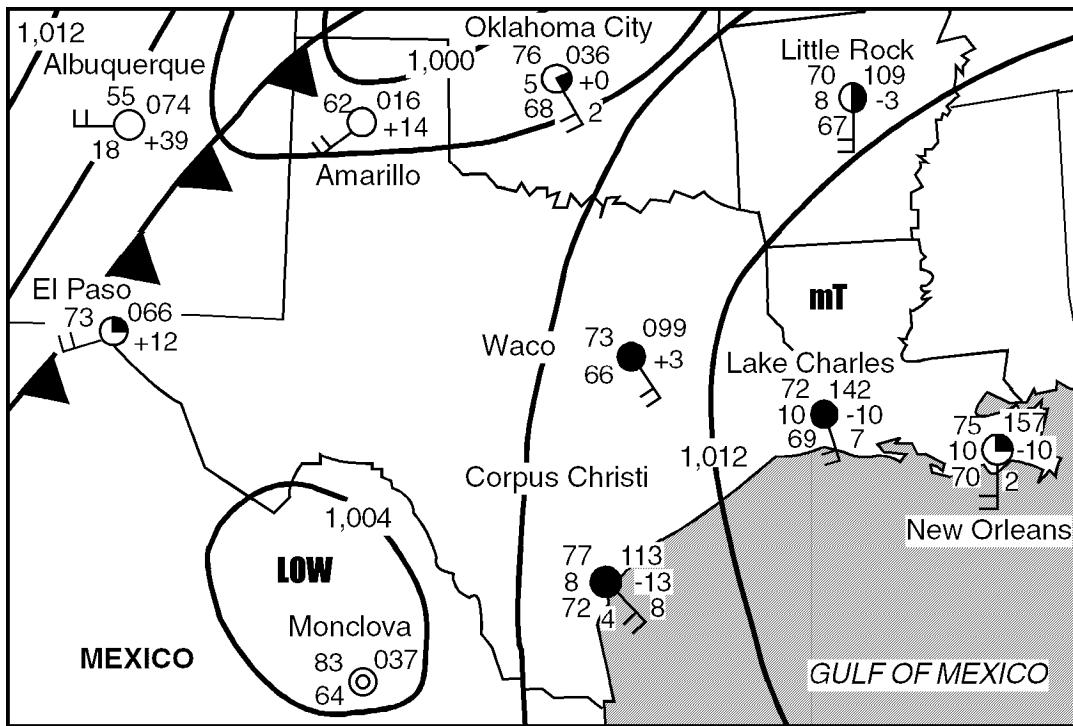


On the station model above, using the proper format, record:

- d the amount of cloud cover
- d the barometric pressure
- d the symbol for the present weather

Questions 357 and 358 refer to the following:

The weather map below shows part of the southern United States and northern Mexico.



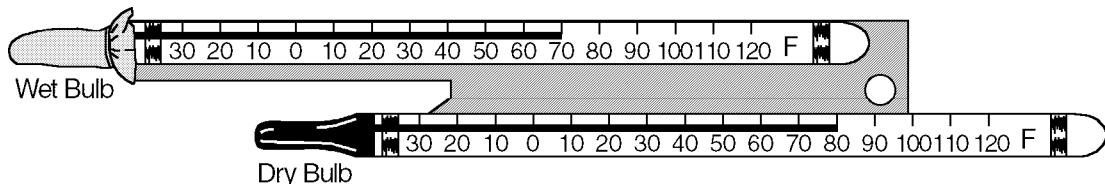
357) At which city is the visibility 8 miles?

- A) Oklahoma City, Oklahoma
- B) Little Rock, Arkansas
- C) Lake Charles, Louisiana
- D) New Orleans, Louisiana

358) Southeast winds at 20 knots are occurring at

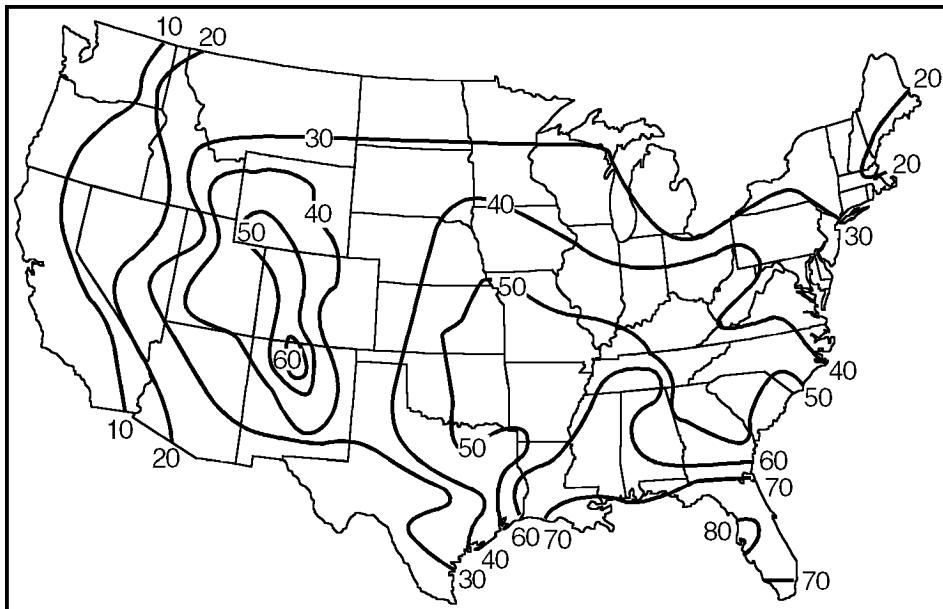
- A) El Paso, Texas
- B) Albuquerque, New Mexico
- C) Amarillo, Texas
- D) Oklahoma City, Oklahoma

359)



What are the equivalent Celsius temperature readings for the Fahrenheit readings shown?

- | | |
|-------------------------|-----------------------|
| A) wet 158DC, dry 176DC | C) wet 26DC, dry 37DC |
| B) wet 21DC, dry 27DC | D) wet 70DC, dry 80DC |
- 360) The map below shows the average yearly number of thunderstorms in the United States.

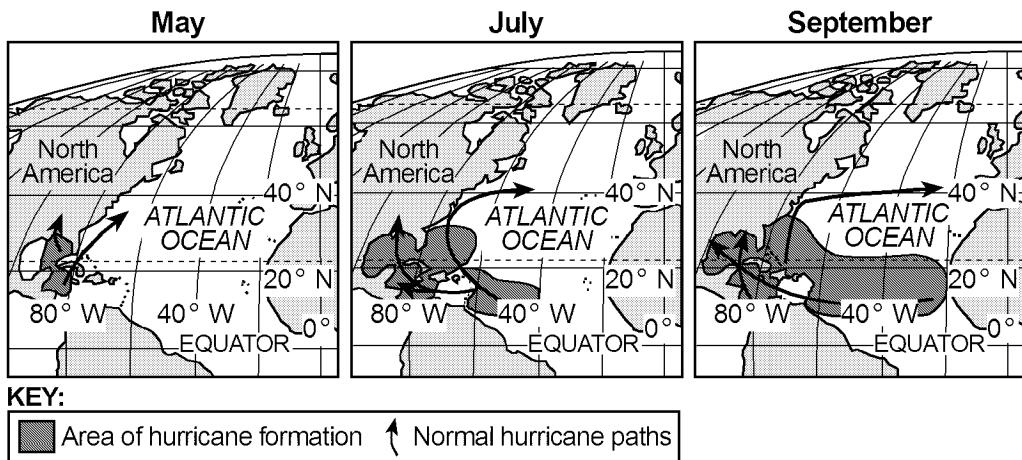


A large number of thunderstorms occur in the southeastern United States. Which type of air mass is most likely the main source of the moisture that produces these thunderstorms?

- A) cP
- B) mT
- C) mP
- D) cT

Questions 361 and 362 refer to the following:

The maps below show areas of hurricane formation and normal hurricane paths in the Atlantic Ocean during May, July, and September. The areas of hurricane formation usually have surface ocean-water temperatures greater than 80°F.

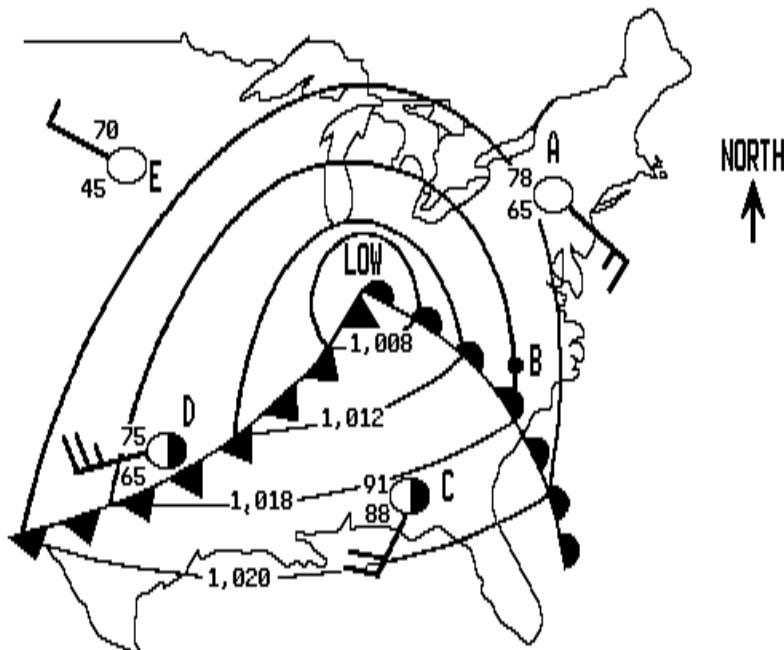


- 361) How does the area of hurricane formation change from May to September?

- 362) State *one* reason why most hurricane paths curve northeastward as hurricanes move north of 30° N latitude.

Questions 363 through 367 refer to the following:

The diagram below represents a weather map showing part of the United States. Letters *A* through *E* represent weather stations.



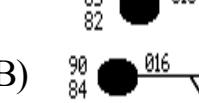
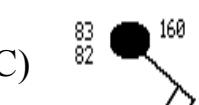
- 363) At which weather station is precipitation most likely occurring at the present time?
A) A C) E
B) D D) B

364) At which weather station is the barometric pressure reading most likely to be 1,018.0 millibars?
A) D C) C
B) A D) B

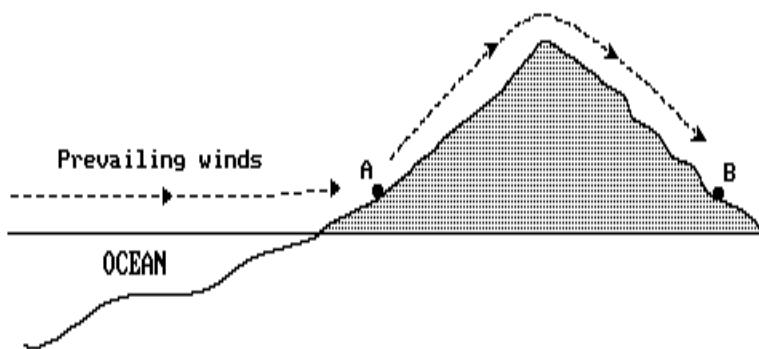
365) If the low-pressure center follows a normal storm track, it will move toward the
A) southeast
B) southwest
C) northeast
D) northwest

366) Which station's weather has been influenced most recently by the passage of a cold front?
A) E C) B
B) D D) C

367) Which weather station model best represents weather conditions at station B?

A) 
B) 
C) 
D) 

- 368) In the diagram of a mountain below, location *A* and location *B* have the same elevation.

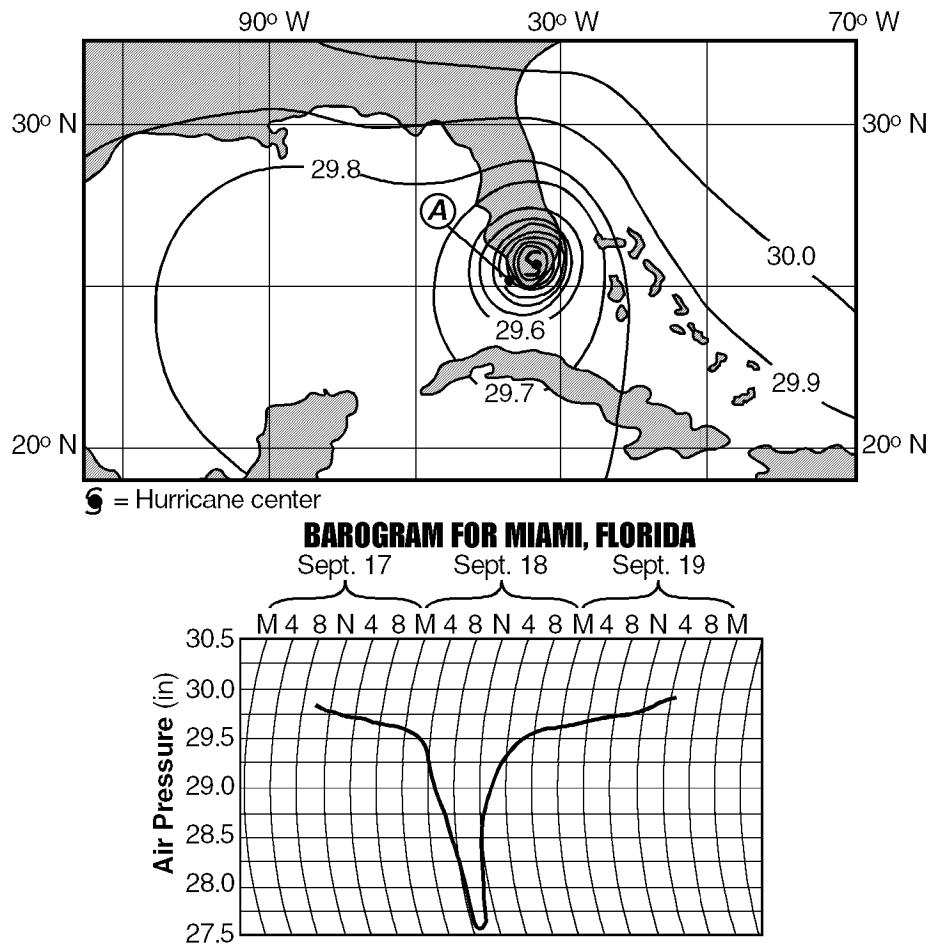


Compared to the climate at location *A*, the climate at location *B* will be

- A) warmer and wetter
- B) cooler and drier
- C) warmer and drier
- D) cooler and wetter

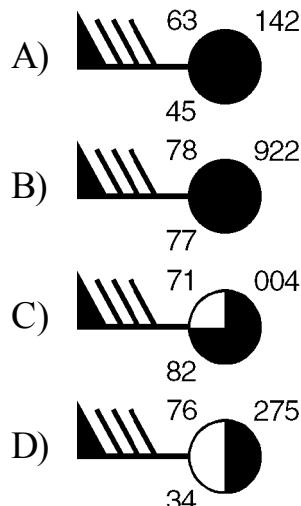
Questions 369 through 371 refer to the following:

The weather map below shows a hurricane that was located over southern Florida. The isobars show air pressure in inches of mercury. Letter A represents a point near the west coast of Florida. The barogram shows the recorded air pressure in inches of mercury as the hurricane passed near Miami, Florida.



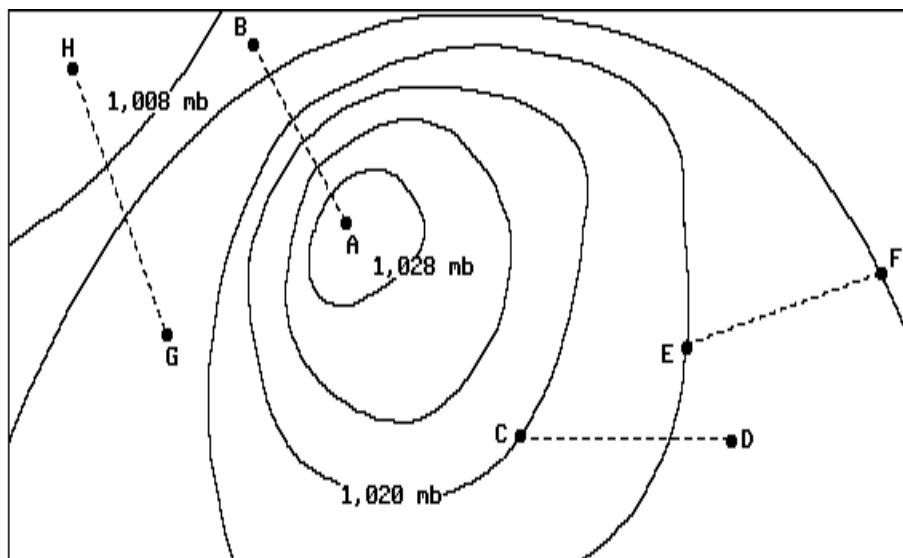
- 369) What was the *lowest* air pressure recorded on the barogram as the hurricane passed near Miami?
- 28.60 in
 - 27.60 in
 - 27.30 in
 - 27.75 in
- 370) Which type of air mass would most likely be the source of the moisture that causes the strong winds and heavy rain associated with this hurricane?
- mT**
 - cP
 - mP**
 - cT

- 371) Which station model *best* represents the weather conditions at point A?



Questions 372 through 376 refer to the following:

The surface weather map below represents a high-pressure center located over the central United States. The air pressure field lines are in millibars and the letters represent the locations of weather stations.



- 372) Along which dashed line would windspeeds be *greatest*?

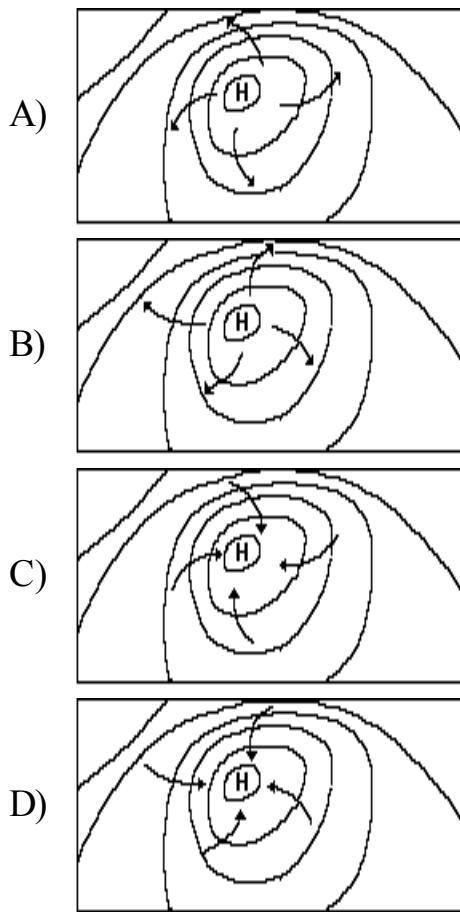
- A) AB C) GH
B) CD D) EF

- 373) If the high-pressure center follows the typical direction of movement of an air mass across the United States, it will probably move toward the

- A) northwest
B) southwest
C) southeast
D) northeast

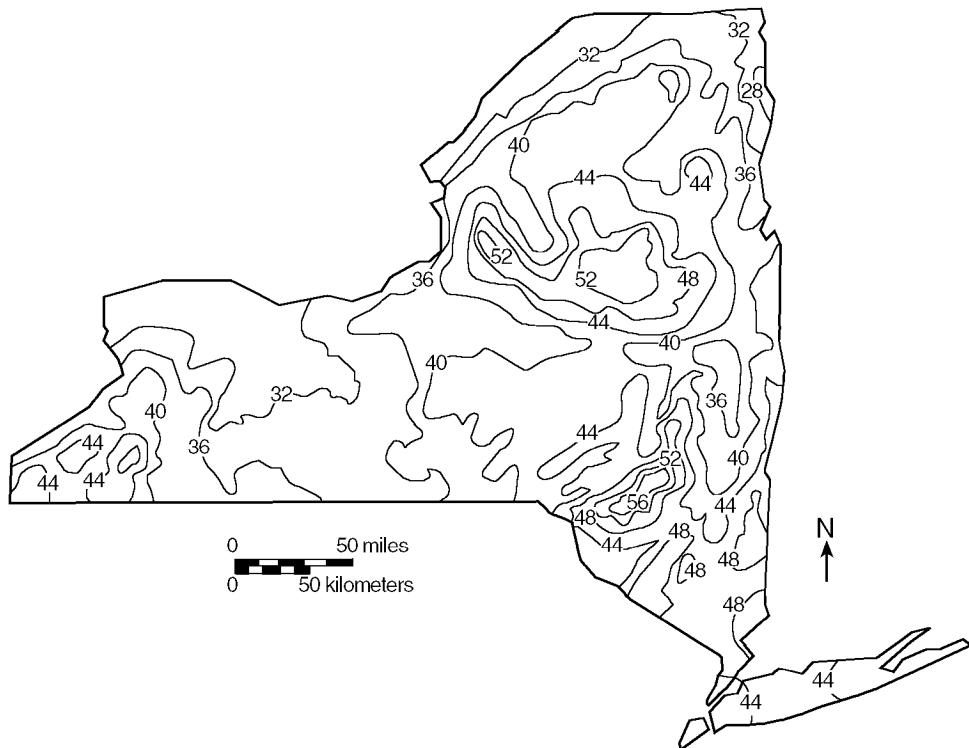
- 374) According to the *Earth Science Reference Tables*, the air pressure recorded at station C is equal to how many inches of mercury?
- A) 30.12 C) 30.35
B) 29.95 D) 30.08
- 375) Which weather station would most likely have the same air pressure reading as station G?
- A) F C) B
B) D D) C

- 376) In which diagram do the arrows best represent actual surface wind directions in this Northern Hemisphere high-pressure center?



Questions 377 and 378 refer to the following:

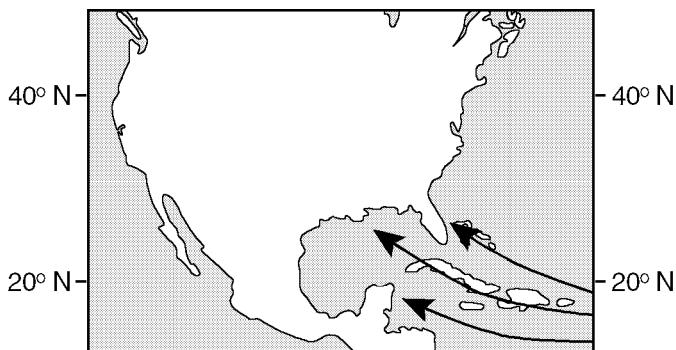
The field map below shows the average annual precipitation in New York State for the past 25 years. Isoline values represent inches per year.



- 377) Jamestown received more rainfall per year than Elmira. A reason for this difference is that Jamestown is located
- A) closer to a large body of water
 - B) at a higher latitude
 - C) at a lower elevation
 - D) in the prevailing southerly wind belt

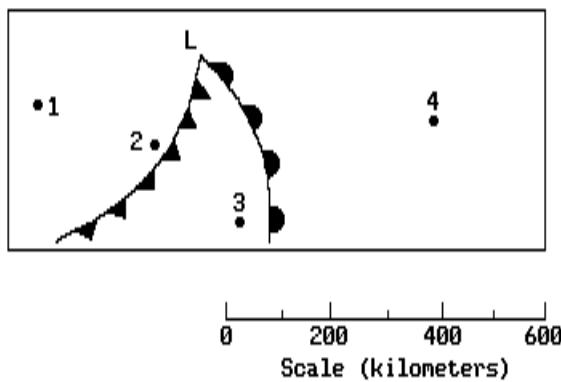
- 378) Which of these locations had the *lowest* average annual precipitation?
- A) New York City
 - B) Old Forge
 - C) Kingston
 - D) Plattsburgh

- 379) The map below shows part of North America.



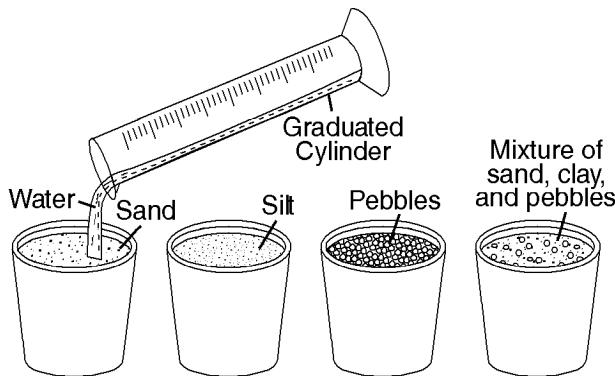
The arrows shown on the map most likely represent the direction of movement of

- A) ocean conduction currents
 - B) Earth's rotation
 - C) the prevailing northeast winds
 - D) Atlantic Ocean hurricanes
- 380) The diagram below shows four points on a map with their relative positions to a low-pressure weather system. Which point is most likely having heavy precipitation?

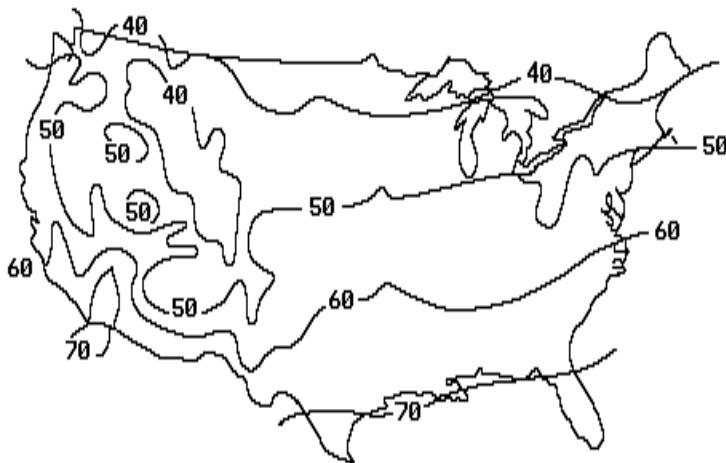


- A) 2
- B) 1
- C) 3
- D) 4

- 381) A student performed a laboratory activity in which water was poured slowly into four cups containing equal volumes of loosely packed sediment samples, as shown in the diagram below. All particles were spherical in shape and uniform in size within a container. After the water level reached the surface of each sample, the student determined the amount of water that had been added.



- The results of the activity should have indicated that approximately equal amounts of water were added to the cups of
- sand, silt, and pebbles, only
 - pebbles and the mixture, only
 - silt and pebbles, only
 - sand, pebbles, and the mixture, only
- 382) The map below shows average annual temperatures in degrees Fahrenheit across the United States.

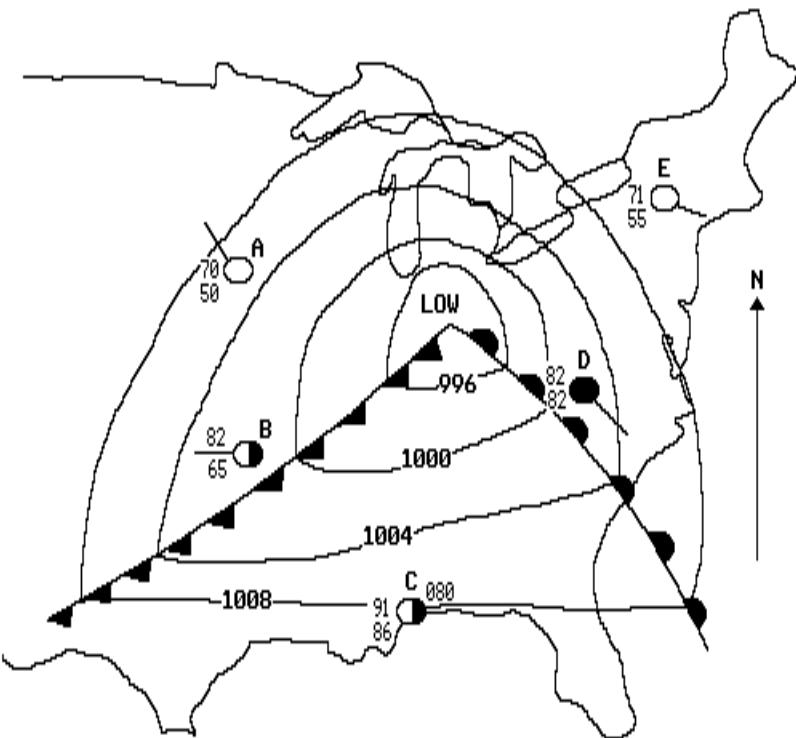


Which climatic factor is most important in determining the pattern shown in the eastern half of the United States?

- mountain barriers
- ocean currents
- elevation above sea level
- latitude

Questions 383 through 387 refer to the following:

The diagram below represents a surface weather map of a portion of the United States. The map shows a low-pressure system with frontal lines and five weather stations *A* through *E*. Note that part of the weather data is missing from each station. [All temperatures are in DF.] [Refer to the *Earth Science Reference Tables*.]



- 383) The atmospheric pressure at the center of the low would most likely be

A) 994 millibars
B) 988 millibars
C) 990 millibars
D) 997 millibars

384) Which weather station has a relative humidity of 100%?

A) D C) C
B) A D) B

385) The weather at station C would most likely be

A) overcast, humid, and cool
B) very dry and extremely hot
C) partly cloudy and warm
D) partly cloudy, windy, and very cold

386) Assuming that the low-pressure system follows a normal storm track, which weather station is probably located in the path of the approaching center of the low?

A) A C) B
B) E D) C

387) The wind direction at station A is

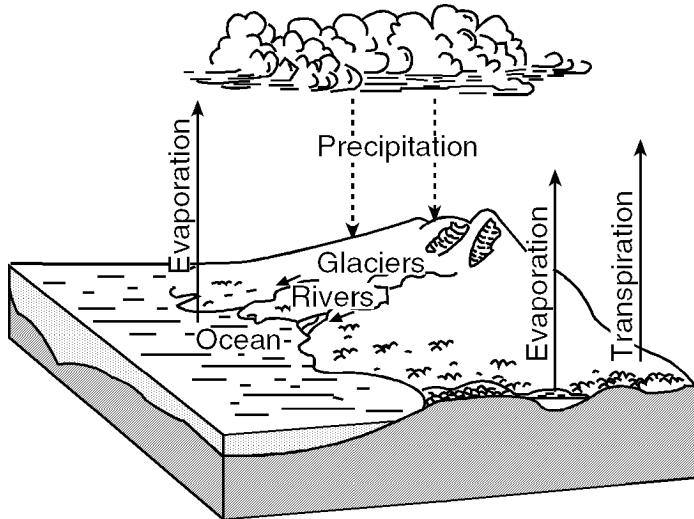
- A) southeast
- B) southwest
- C) northwest
- D) northeast

388) The table below shows the noontime data for air pressure and air temperature at a location over a period of one week.

Date	Nov. 9	Nov. 10	Nov. 11	Nov. 12	Nov. 13	Nov. 14	Nov. 15
Air Temperature ($^{\circ}\text{C}$)	1	6	0	-2	-4	5	10
Air Pressure (millibars)	1024	998	1015	1021	1030	1013	?

Based on the data provided, which air pressure would most likely occur at noon on November 15?

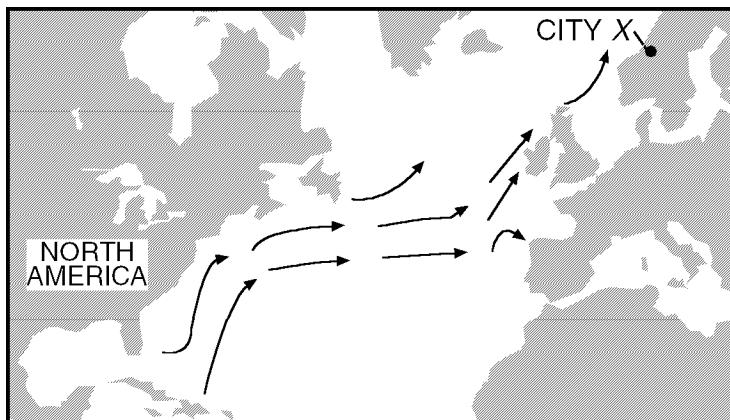
- | | |
|-------------------|-------------------|
| A) 1017 millibars | C) 1022 millibars |
| B) 1015 millibars | D) 987 millibars |
- 389) The diagram below represents the water cycle.



Precipitation is most likely occurring at the time represented in the diagram because

- A) the water droplets are heavy enough to fall
- B) the air has been warmed due to expansion
- C) no condensation nuclei are present in the air
- D) the relative humidity of the air is low

390) Arrows on the map below represent ocean currents.

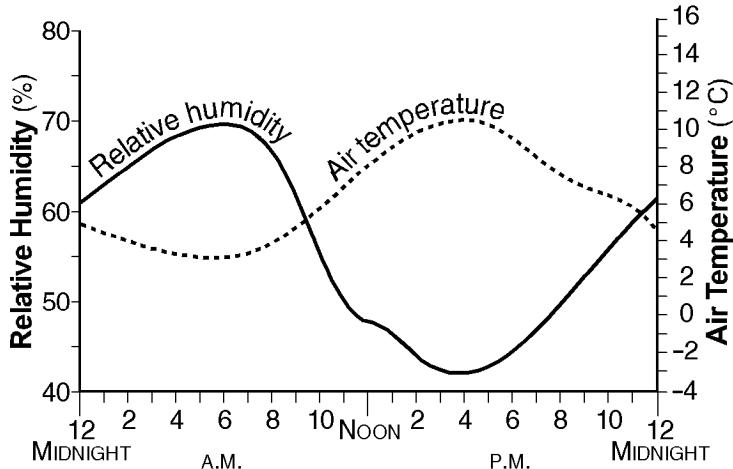


These ocean currents affect the climate pattern of city *X* by

- A) increasing the average annual air pressure
- B) increasing the average annual temperature
- C) decreasing the average annual evapotranspiration
- D) decreasing the average annual cloud cover

Questions 391 and 392 refer to the following:

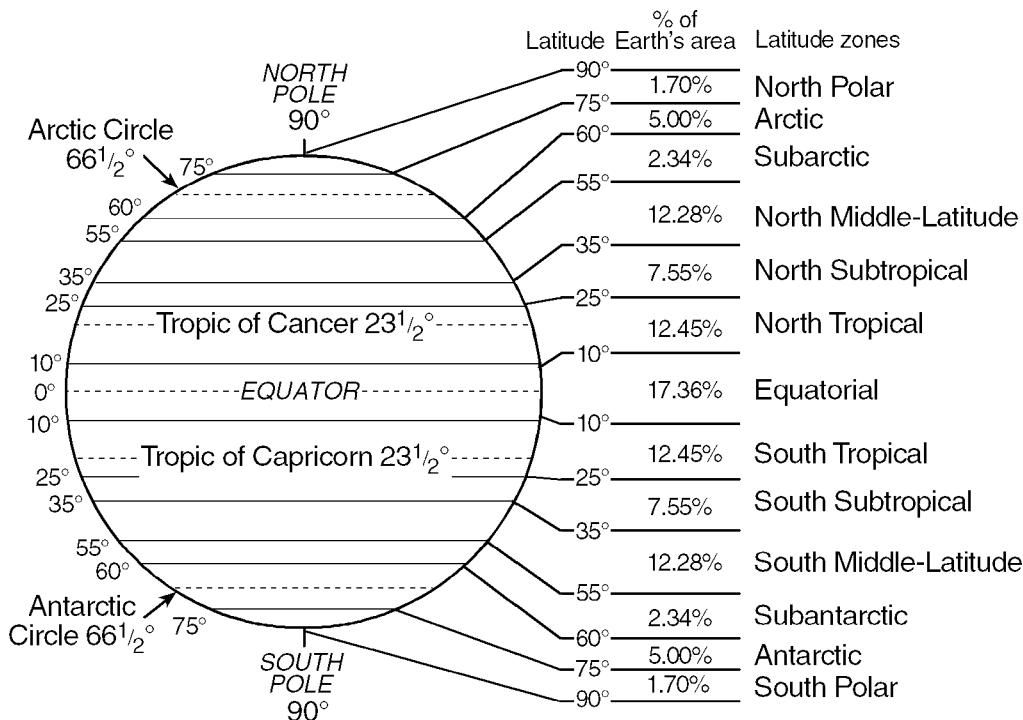
The graph below shows the changes in relative humidity and air temperature during a spring day in Washington, D.C.



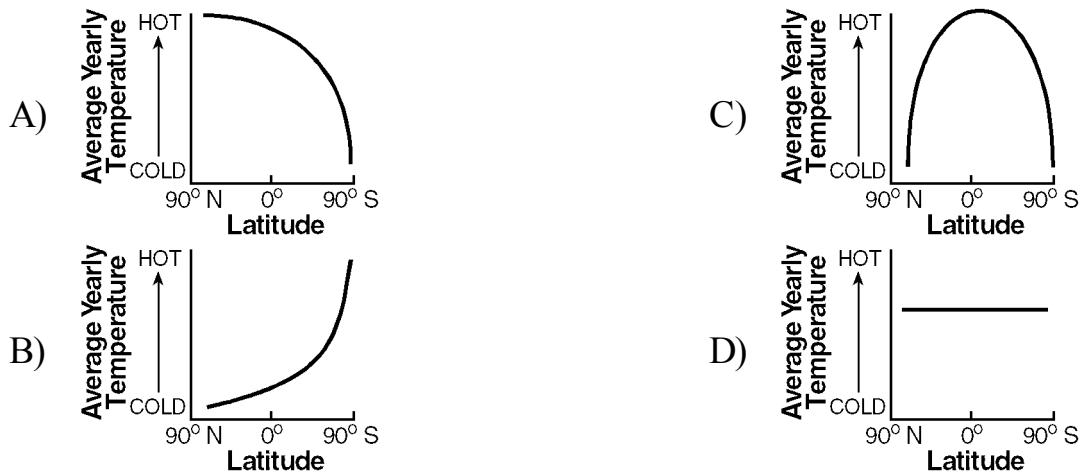
- 391) Which statement *best* describes the relationship between relative humidity and air temperature as shown by the graph?
- A) Relative humidity decreases as air temperature decreases.
 - B) Relative humidity remains the same as air temperature decreases.
 - C) Relative humidity increases as air temperature increases.
 - D) Relative humidity decreases as air temperature increases.

- 392) What were the relative humidity and air temperature at noon on this day?
- A) 47% and 32DF
 - B) 47% and 48DF
 - C) 65% and 32DF
 - D) 65% and 48DF

- 393) The diagram below shows the latitude zones of the Earth.

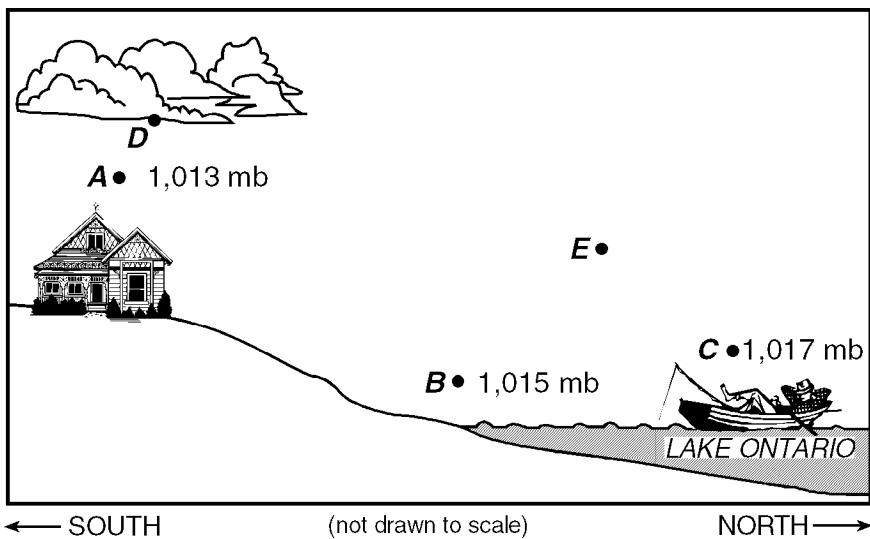


Which graph *best* represents the relationship between average yearly temperatures and latitude?



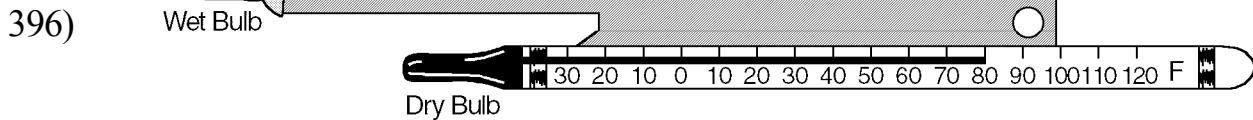
Questions 394 and 395 refer to the following:

The diagram below shows a section of the shore of Lake Ontario. Surface air-pressure readings are shown for three of the locations.



- 394) The water vapor that formed the clouds most likely entered the atmosphere by the processes of
- evaporation and transpiration
 - condensation and precipitation
 - transpiration and precipitation
 - condensation and evaporation

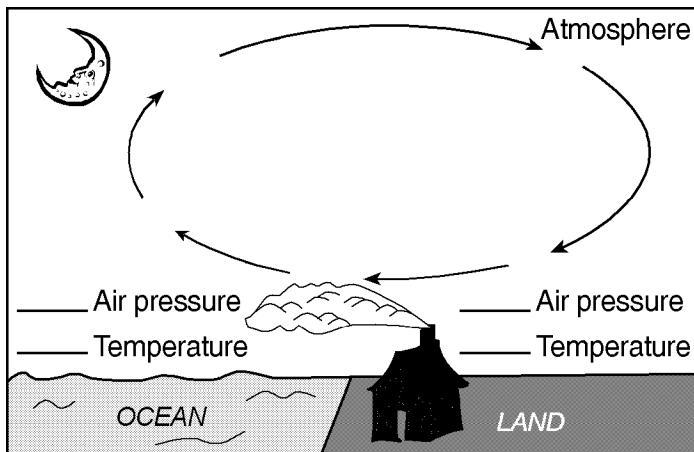
- 395) Why do the clouds begin to form at the elevation of D?
- The air below this elevation does not have enough condensation nuclei for clouds to form.
 - The temperature is 0°C at this elevation.
 - The air has cooled to the dewpoint temperature at this elevation.
 - The water droplets are too small to be seen below this elevation.



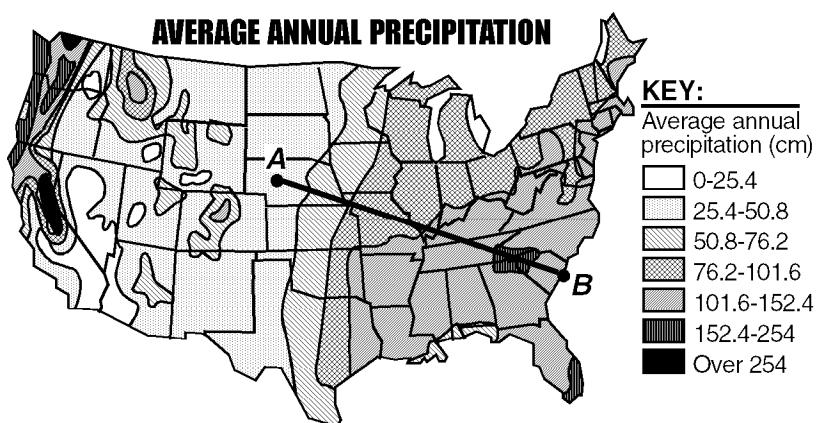
Which weather variables are most easily determined by using this weather instrument and the *Earth Science Reference Tables*?

- air pressure and cloud type
- air temperature and windspeed
- relative humidity and dewpoint
- visibility and wind direction

- 397) The cross section below represents a house at an ocean shoreline at night. Smoke from the chimney is blowing out to sea.



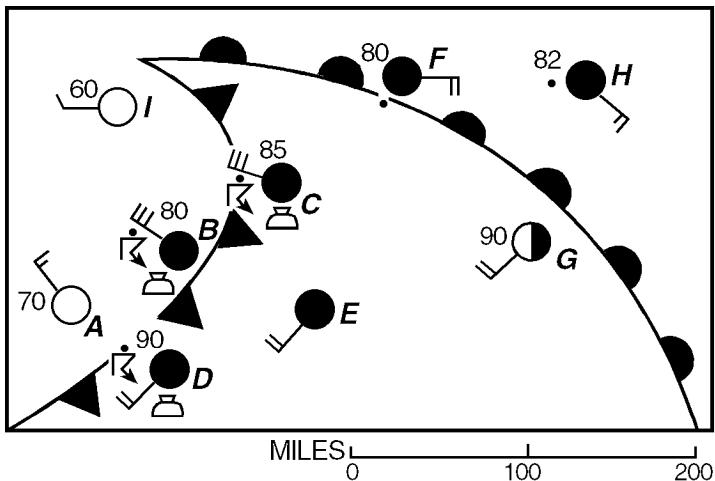
- (a) Label the *two* lines provided on the cross section above to show where air pressure is relatively "high" and where it is relatively "low."
- (b) Assume that the wind blowing out to sea on this night is caused by local air-temperature conditions. Label the *two* lines provided on the cross section above to show where Earth's surface air temperature is relatively "warm" and where it is relatively "cool."
- 398) Map B below shows the average annual precipitation for sections of the United States.



Which section of the United States has high potential evapotranspiration with very little precipitation?

- A) Northwest
B) Southwest
C) Southeast
D) Northeast

- 399) The weather map below shows a low-pressure system over the eastern part of the United States. Weather data is given for cities *A* through *I*. The temperature at city *E* has been left blank.

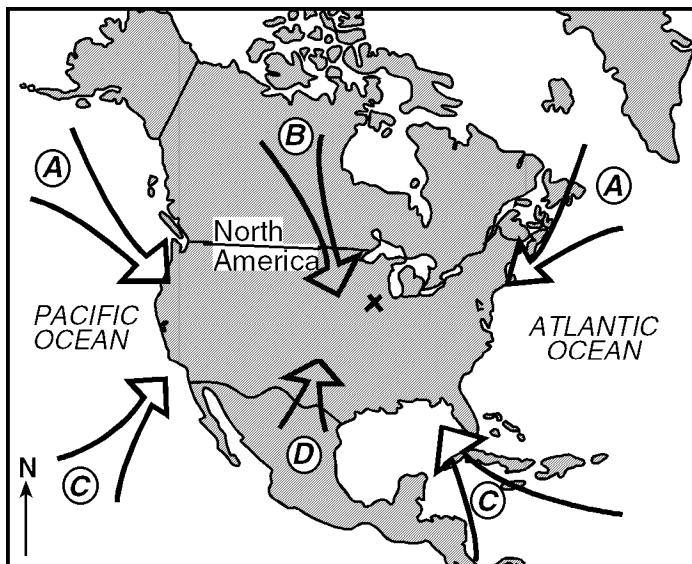


The symbol ☂ represents a cumulonimbus cloud. What is the most probable explanation for the absence of this cloud at city *A*?

- A) City *A*'s atmosphere lacks the necessary moisture.
- B) City *A* is located ahead of the cold front.
- C) Cumulonimbus clouds form only when a location has southwesterly winds.
- D) Cumulonimbus clouds form only at temperatures higher than 70°F.

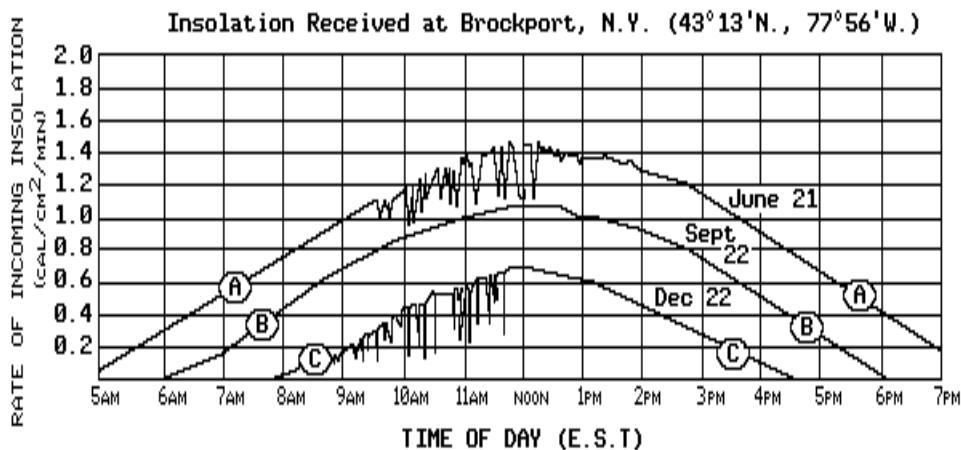
Questions 400 through 404 refer to the following:

The map below shows the source regions for various types of air masses affecting the weather of the continental United States. Regions labeled with the same letter produce air masses with similar characteristics. Point *X* represents a location in the central United States.



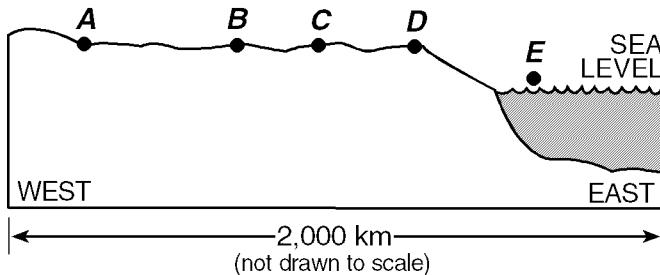
- 400) On a weather map, which symbol would be used to represent an air mass that formed in region *B*?
A) cP C) mT
B) mP D) cT
- 401) Which factor is most responsible for the differences in land-surface temperatures between source regions *B* and *D*?
A) latitude
B) cloud cover
C) soil particle type
D) size of the area
- 402) Which map symbol represents a stationary front that formed when an air mass from source region *B* met an air mass from source region *D*?
A) 
B) 
C) 
D) 
- 403) Which atmospheric conditions will most likely exist when air masses from source regions *B* and *C* meet at point *X*?
A) decreasing relative humidity and rising temperature
B) clearing skies and little wind
C) appearance of condensation nuclei and a constant dewpoint temperature
D) cloudiness and precipitation
- 404) Which source region will produce a warm, moist air mass?
A) *A* C) *C*
B) *B* D) *D*

- 405) The graph below shows the varying amounts of insolation received at Brockport, New York, on three different dates under clear or partly cloudy skies.



How would insolation curves for the same three dates in Rome, N.Y. ($43^{\circ}13'N$, $75^{\circ}27'W$) compare to the curves for Brockport, N.Y. ($43^{\circ}13'N$, $77^{\circ}56'W$), assuming the same type sky and cloud conditions?

- A) The Rome curves would be lower and shorter.
 - B) The Rome curves *A* and *B* would be higher and longer, but curve *C* would be lower and shorter.
 - C) The Rome curves would appear essentially the same.
 - D) The Rome curves would be higher and longer.
- 406) The diagram below represents a landscape profile. Points *A*, *B*, *C*, *D*, and *E* are locations in the mid-latitudes of the Northern Hemisphere.

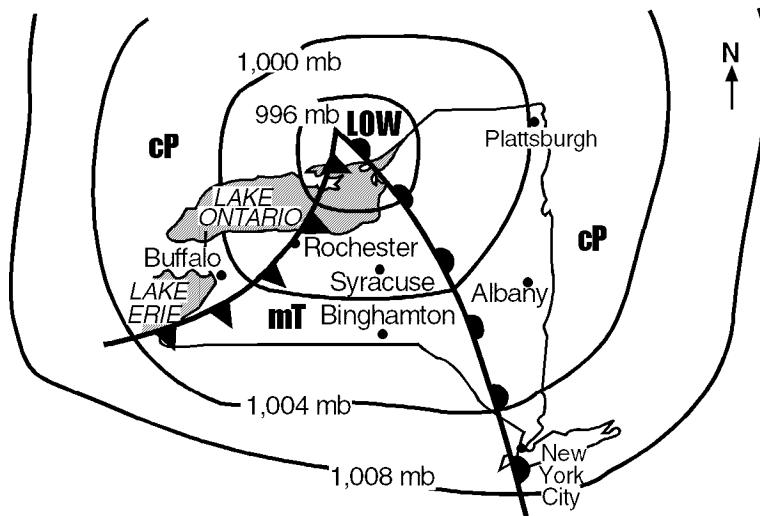


At which location would the daily temperature range during the month of July be *smallest*?

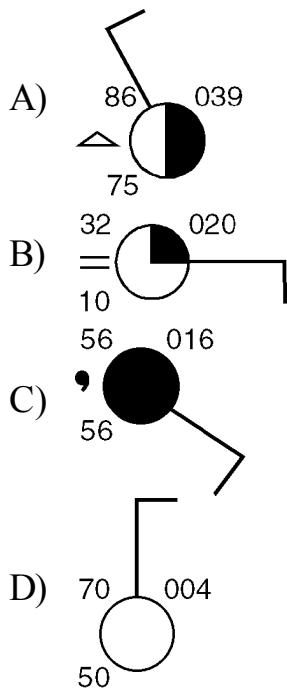
- A) *E*
- B) *C*
- C) *D*
- D) *B*

Questions 407 through 409 refer to the following:

The weather map below shows a low-pressure storm system located over New York State in midsummer.



- 407) Which weather station model best represents the weather conditions in Albany, where a slow, steady drizzle is occurring?



- 408) Which city has the *highest* air pressure?

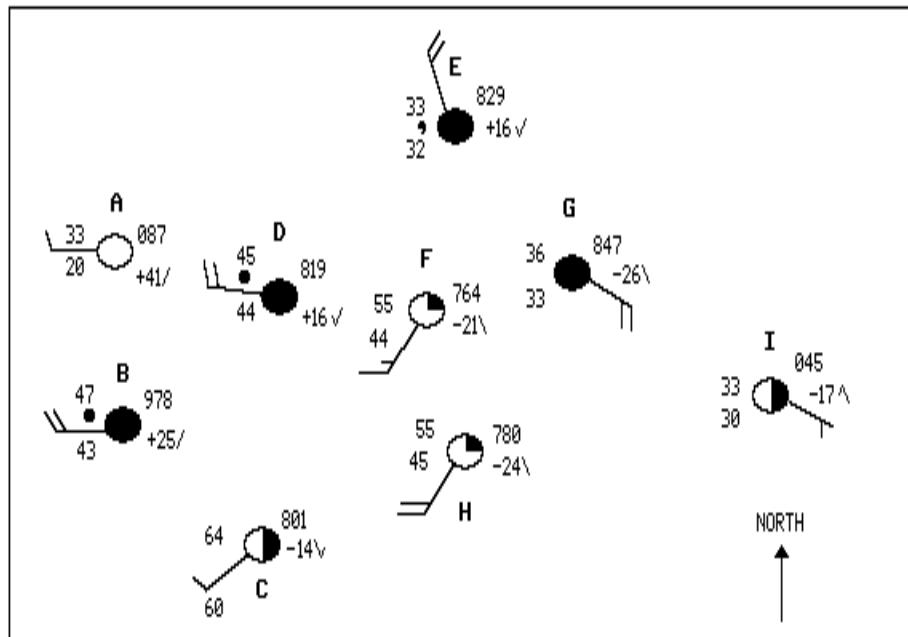
- A) Syracuse
- B) Rochester
- C) Plattsburgh
- D) New York City

- 409) In which city is a thunderstorm most likely occurring?

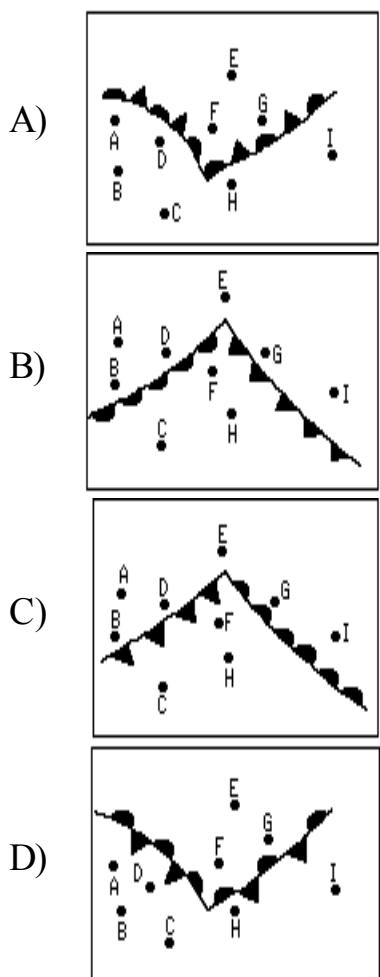
- A) Binghamton
- B) New York City
- C) Rochester
- D) Plattsburgh

Questions 410 through 413 refer to the following:

The diagram below represents a section of a weather map for locations in the central United States. The letters *A* through *I* identify reporting weather stations.

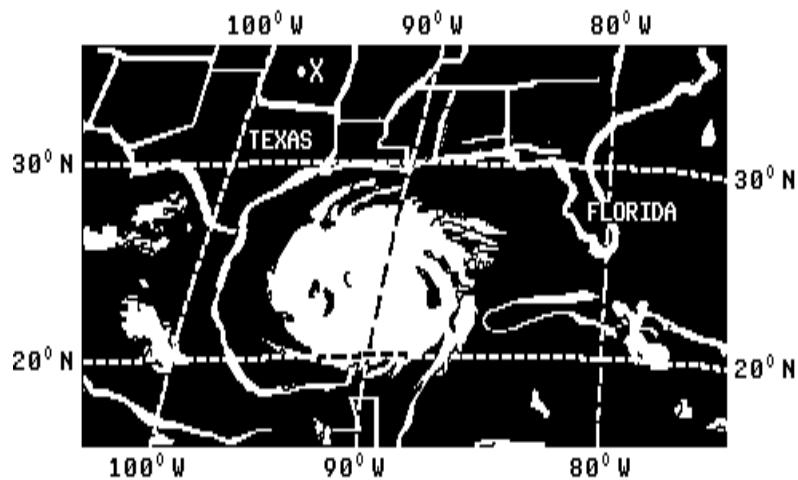


- 412) Which diagram best shows the fronts and their locations on the weather map?

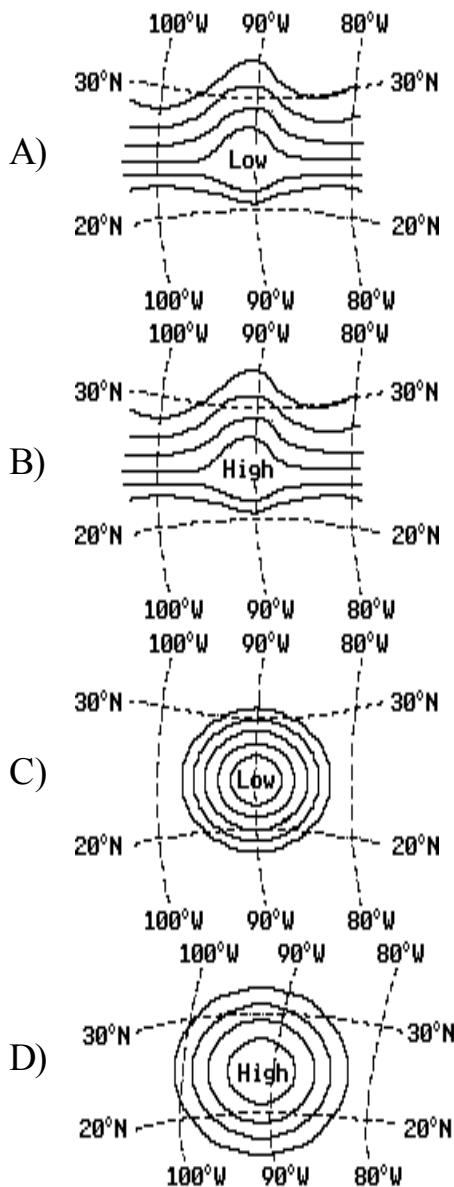


Questions 414 through 417 refer to the following:

In the satellite diagram below, a tropical storm (white cloud swirl) is centered in the Gulf of Mexico. An outline of the southwestern United States and the latitude-longitude system have also been drawn.



- 414) Which map best represents the surface air-pressure field of this tropical storm? [The solid lines represent isobars.]



- 415) At the time this photograph was taken, the weather conditions at point *X* could be described as

- A) partial cloud cover with scattered precipitation
- B) clear skies and sunny
- C) heavy cloud cover but no precipitation
- D) heavy precipitation associated with the storm

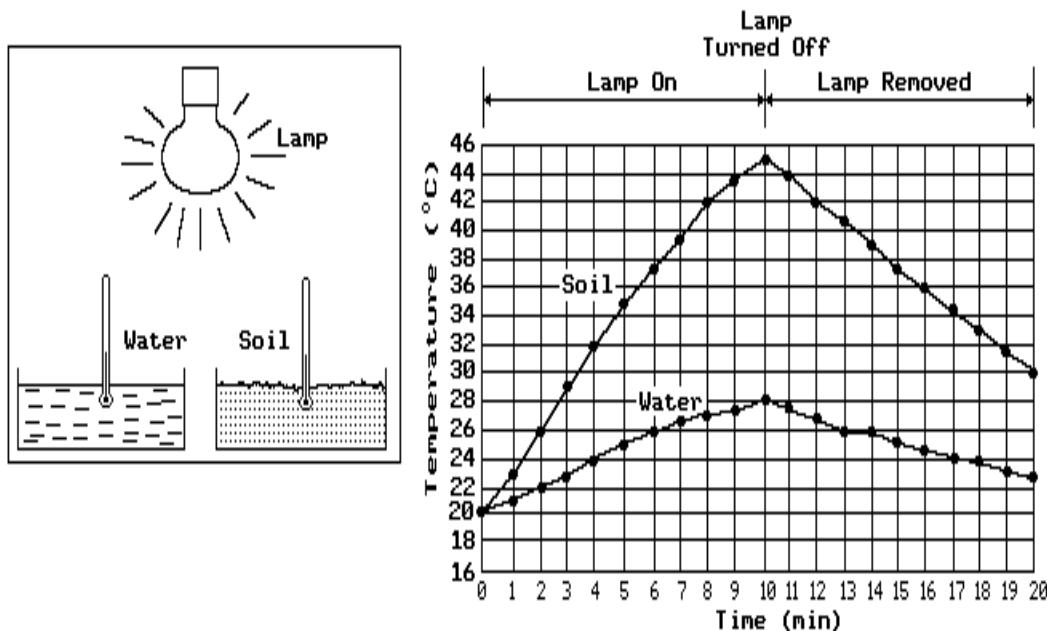
- 416) What type of air mass would most likely be associated with the storm in the satellite diagram?

- A) cold and dry
- B) cold and moist
- C) warm and moist
- D) warm and dry

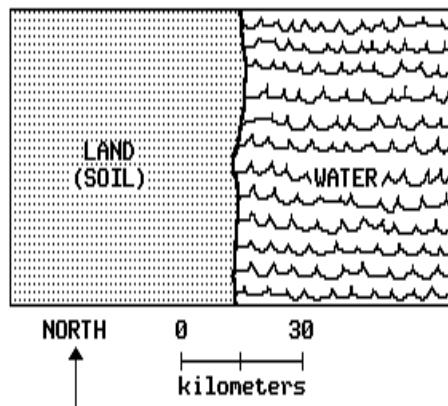
- 417) What is the primary source of moisture for this storm?

- A) evaporation of ocean water
- B) evaporation of river water
- C) transpiration from tropical jungles
- D) melting of southern glaciers

- 418) In the diagram below, equal masses of water and soil are located at identical distances from the lamp. Both were heated for ten minutes and then the lamp was removed. The water and soil were then allowed to cool for ten minutes. The graph shows the temperature data obtained during the investigation.



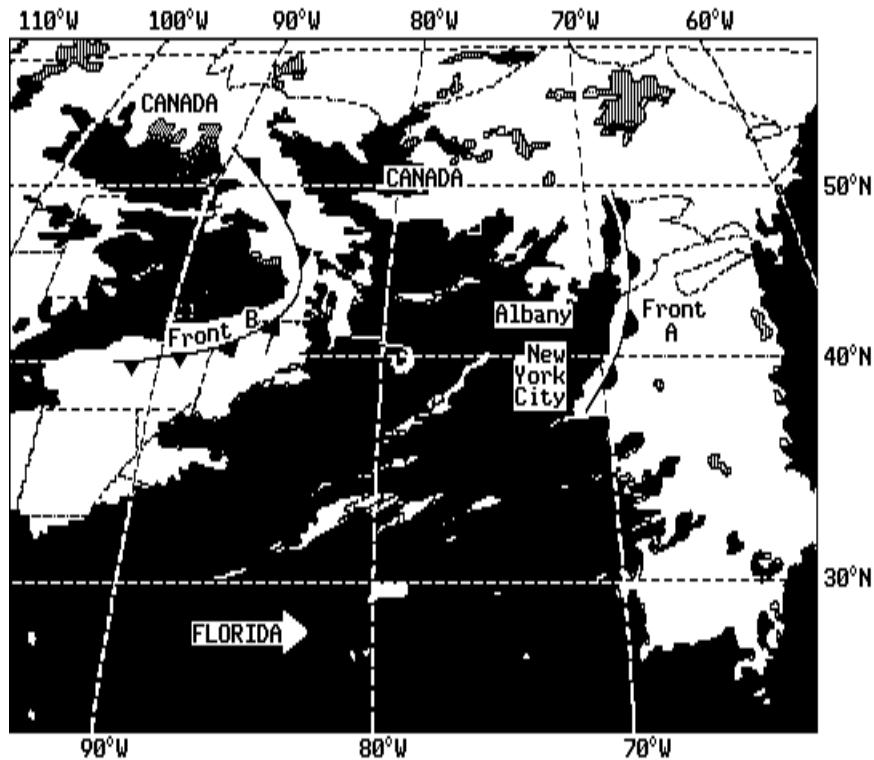
Assume that the soil and water in this investigation heat and cool in the same manner as the land and water on the map below. At the time of highest temperature readings, in which direction would the wind most likely be blowing?



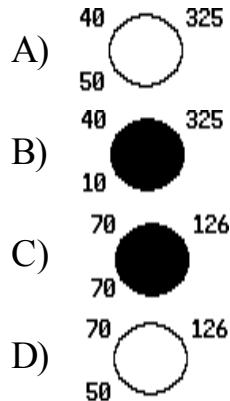
- A) south to north
- B) west to east
- C) east to west
- D) north to south

Questions 419 through 423 refer to the following:

The representation of a satellite photograph below was taken in June. The photograph shows two large cloud systems associated with frontal systems that are moving eastward across eastern North America. A latitude-longitude grid system and state border outlines are also shown on the photograph.



- 419) Which weather symbol would most likely represent the weather conditions at New York City at the time when the photograph was taken?



- 420) At 45°N. latitude, the present location of front B is approximately at which longitude?

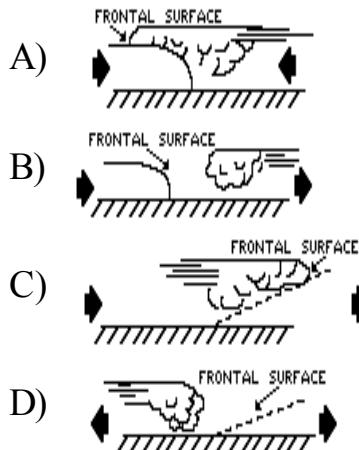
- A) 85°W.
- C) 75°W.
- B) 95°W.
- D) 65°W.

- 421) What was probably the source region of the airmass located behind front B?

- A) Florida
- B) central Mexico
- C) central Canada
- D) New York

- 422) In 36 hours front *B* moved to the present position of front *A*. How did the weather conditions for Albany, N.Y., change during this 38-hour period?
- Light precipitation occurred during the entire period.
 - The temperature increased steadily.
 - Clear skies became overcast and then clear again.
 - The barometric pressure increased steadily then became constant.

- 423) Which cross-sectional diagram of the atmosphere best represents the direction of airmass movement, cloud cover, and shape of the frontal surface as seen looking north along front *A* at 45°N. latitude?



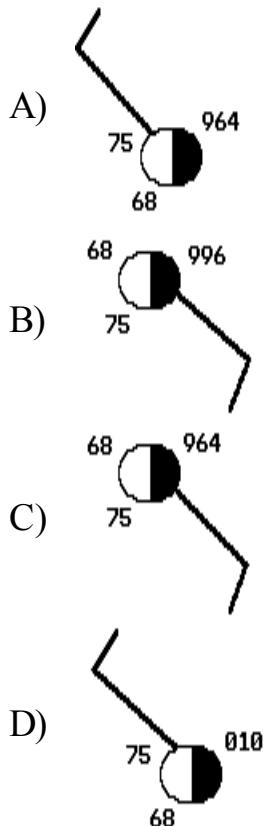
Questions 424 through 427 refer to the following:

DATA TABLE

	Temperature (to nearest degree)	Air Pressure (mb)	Dewpoint (to nearest degree)	Wind Direction and Speed (knots)
9 a.m. Monday	24°C (75°F)	996.4	20°C (68°F)	NW 10
9 a.m. Tuesday	20°C (68°F)	962.4	19°C (66°F)	SSE 25
9 a.m. Wednesday	17°C (63°F)	1013.8	12°C (54°F)	W 15
9 a.m. Thursday	7°C (45°F)	1020.2	-2°C (28°F)	N 10

- 424) Which region is the most likely source of the airmass over this location on Thursday?
- the south Atlantic
 - southern California
 - the Gulf of Mexico
 - northern Canada

- 425) Which weather station model most likely represents the weather conditions at 9 a.m. on Monday?



- 426) On which day did precipitation most likely occur?

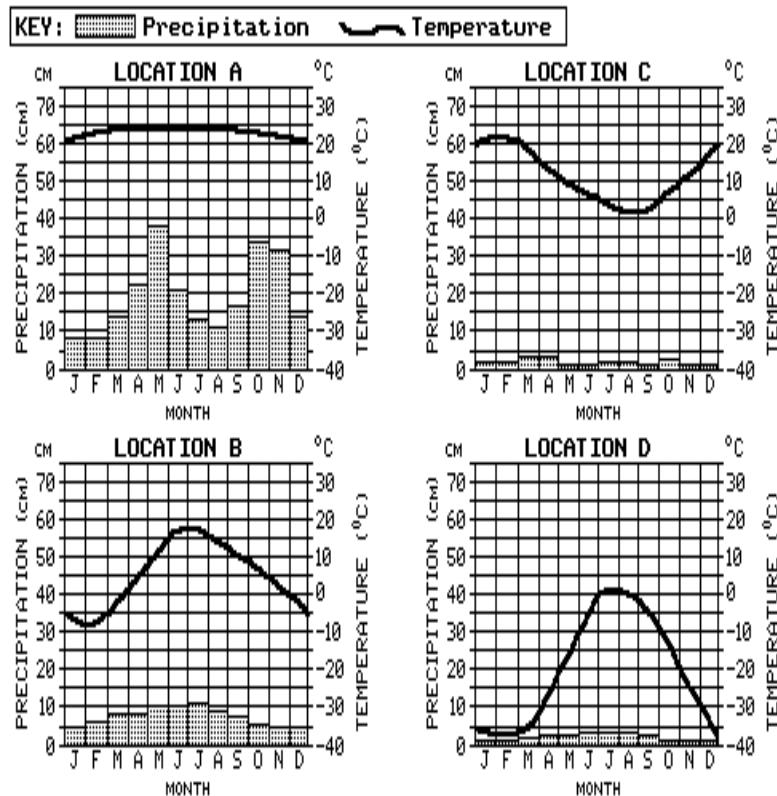
- A) Wednesday
- B) Thursday
- C) Monday
- D) Tuesday

- 427) According to the wind speeds shown, on which day did the highest pressure gradient most probably exist between this location and another nearby region?

- A) Thursday
- B) Monday
- C) Wednesday
- D) Tuesday

Questions 428 through 431 refer to the following:

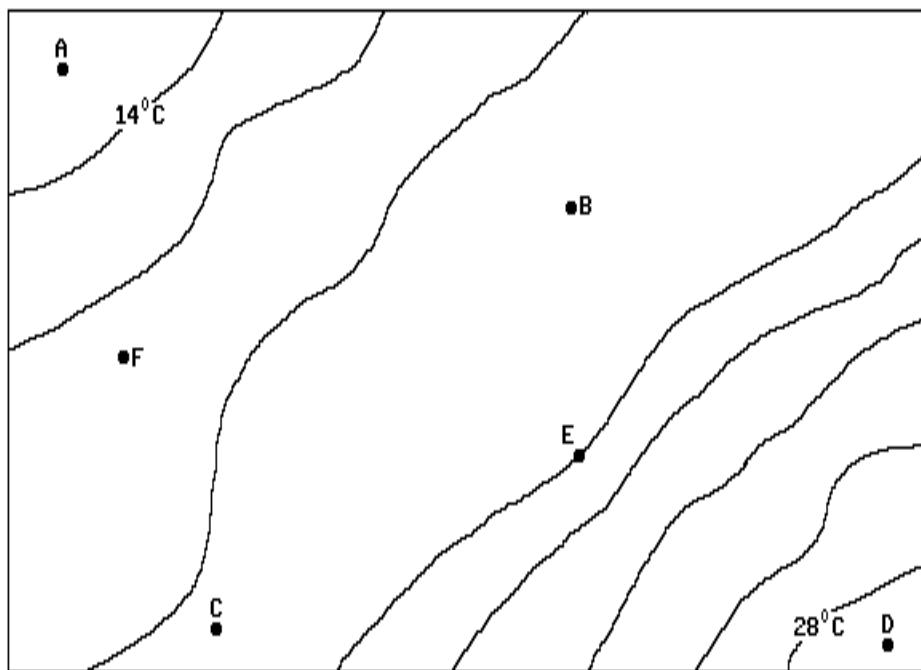
Each climate graph shown below indicates the average monthly temperatures and the average monthly precipitation for a particular location. Precipitation amounts are shown by the shaded bars and are read from the scale at the left of the graph. Temperatures are shown by the solid line and are read from the scale at the right of the graph.



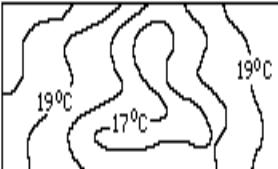
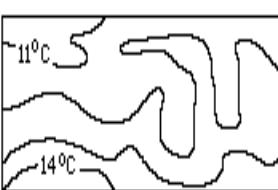
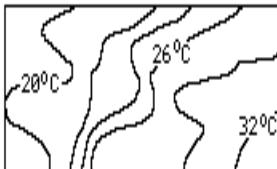
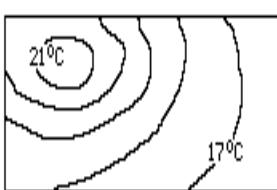
- 428) Which statement best explains the small temperature range at location *A*?
- Location *A* has a very high elevation.
 - Location *A* is far from any large body of water.
 - Location *A* is close to the Equator.
 - Location *A* is located in a high-pressure wind belt.
- 429) Which location is in the Southern Hemisphere?
- C*
 - A*
 - D*
 - B*

- 430) Which location shows the *greatest* amount of change in average monthly precipitation?
- D*
 - A*
 - C*
 - B*
- 431) Which location has a climate typical of a region near the North Pole?
- D*
 - A*
 - C*
 - B*

- 432) The isoline map below represents various temperatures taken 1 meter above the floor in a closed room. Letters A through F are various locations in the room also located 1 meter above the floor.

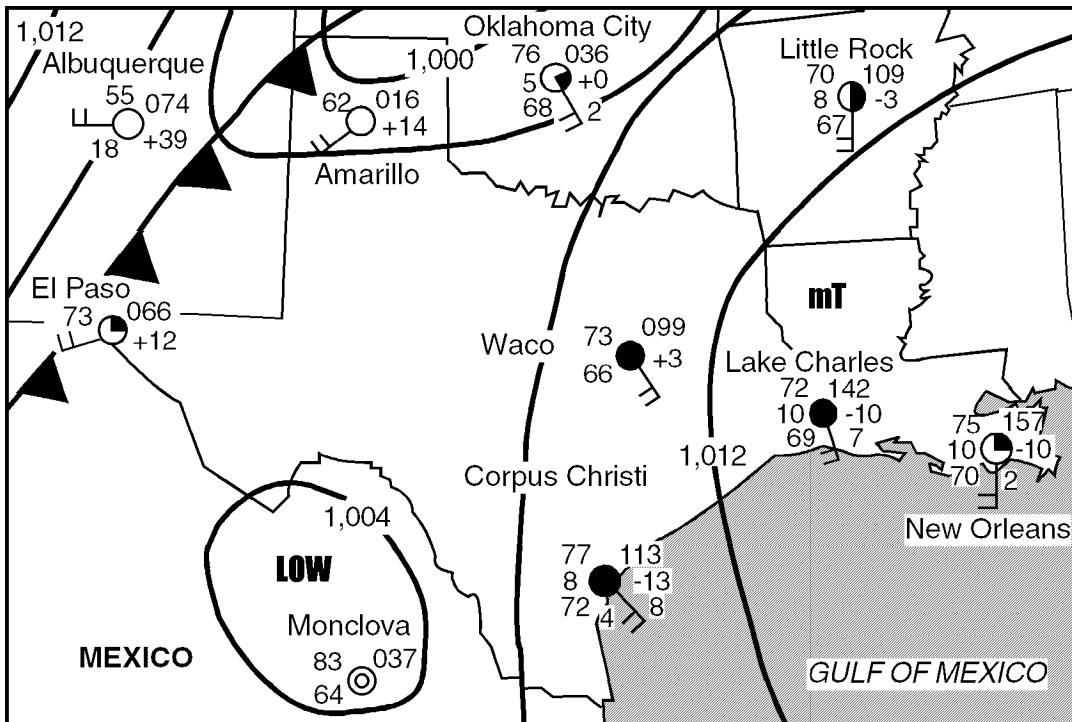


Which isoline map most likely represents the temperature field at the ceiling of this room?

- A) 
- B) 
- C) 
- D) 

Questions 433 and 434 refer to the following:

The weather map below shows part of the southern United States and northern Mexico.



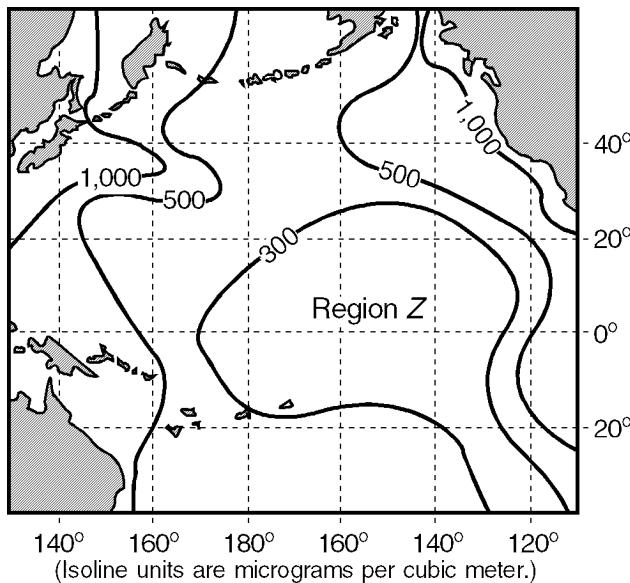
- 433) Which kind of air mass is influencing the weather of Lake Charles, Louisiana?

- A) cold and dry
- B) warm and dry
- C) warm and moist
- D) cold and moist

- 434) Which city has the *least* chance of precipitation during the next 3 hours?

- A) Oklahoma City, Oklahoma
- B) Lake Charles, Louisiana
- C) Albuquerque, New Mexico
- D) Waco, Texas

- 435) The field map below shows isoline measurements of volcanic ash suspended in the troposphere above the Pacific Ocean region.

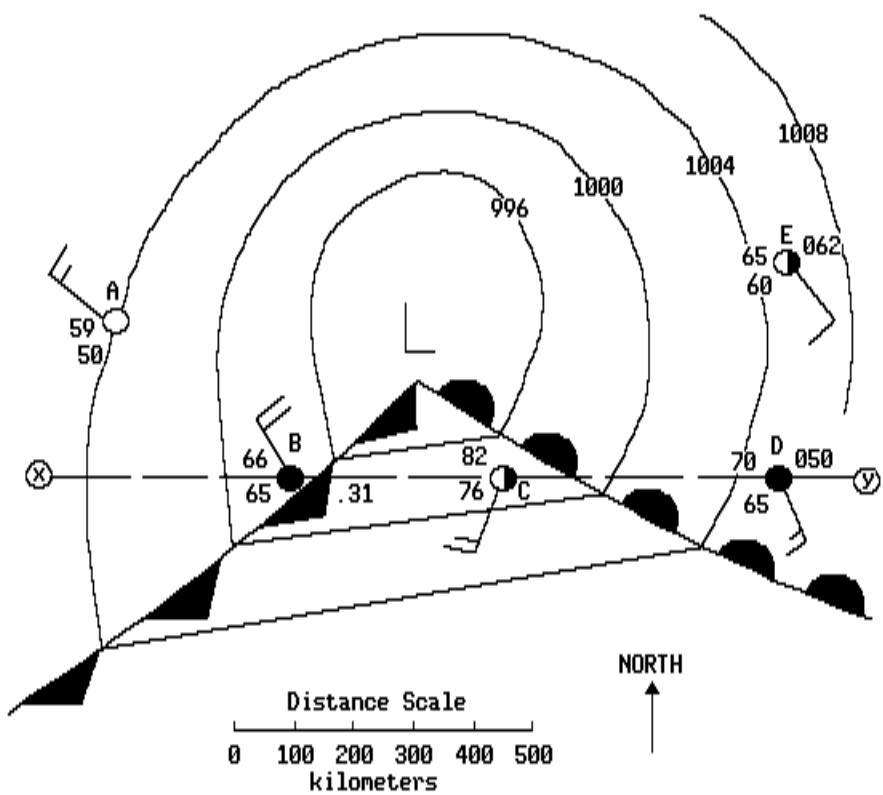


Which statement *best* explains why the atmosphere over region Z has considerably less volcanic ash than other areas?

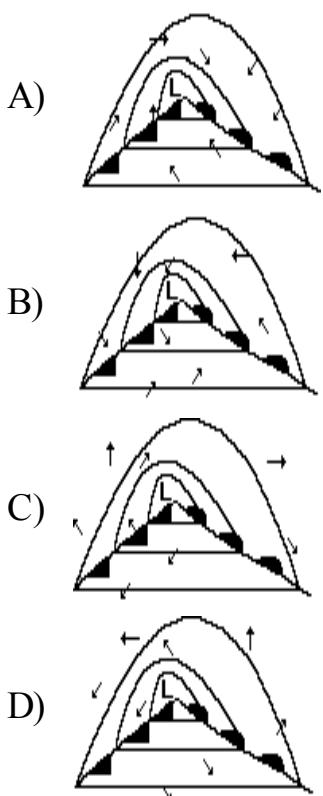
- A) The equatorial regions have high rainfall, and region Z is close to sources of volcanic ash.
- B) The equatorial regions have low rainfall, and region Z is close to sources of volcanic ash.
- C) The equatorial regions have high rainfall, and region Z is far from sources of volcanic ash.
- D) The equatorial regions have low rainfall, and region Z is far from sources of volcanic ash.

Questions 436 through 440 refer to the following:

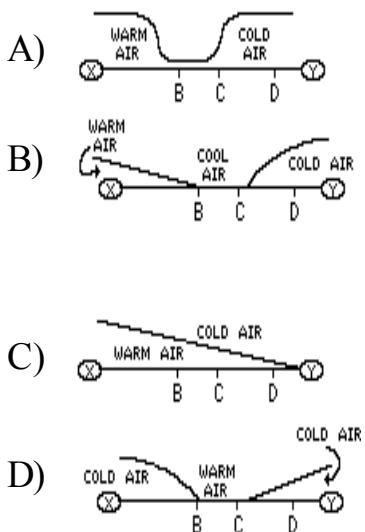
The map below represents a weather system located over the central United States. Letters A, B, C, D, and E locate weather stations on the map.



- 436) In which diagram do the arrows best represent the wind direction in the weather system?



- 437) Which diagram best represents a cross section of the Earth's atmosphere showing the fronts between airmasses as they would appear along line $x\#y$?



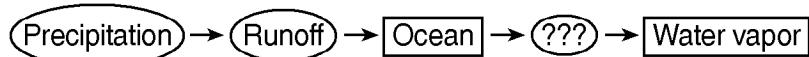
- 439) If the weather system follows a normal storm track at a speed of 50 kilometers per hour, which best describes the atmospheric changes which will most likely occur at weather station *C* in about six hours?

 - A) air temperature increase, air pressure increase, and clearing sky
 - B) little atmospheric change with a low probability of precipitation
 - C) air temperature increase, no change in air pressure, and clearing sky
 - D) air temperature decrease, air pressure increase, and precipitation

- 440) What is the air pressure at weather station A?

 - A) 1069 mb
 - B) 1000 mb
 - C) 1004 mb
 - D) 1064 mb

- 441) The flowchart below shows part of Earth's water cycle. The question marks indicate a part of the flowchart that has been deliberately left blank.

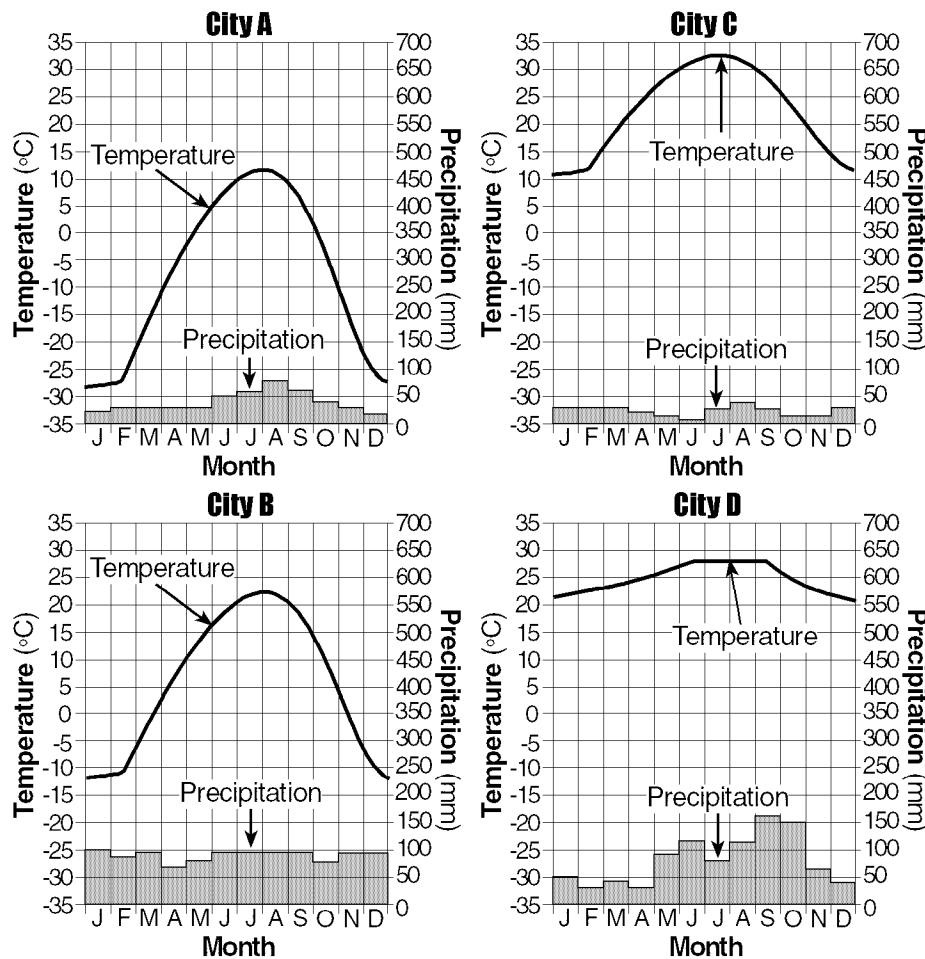


Which process should be shown in place of the question marks to *best* complete the flowchart?

- A) condensation
B) evaporation
C) deposition
D) infiltration

Questions 442 and 443 refer to the following:

Each graph below represents data for a different city in North America. The line graphs connect the average monthly temperatures in degrees Celsius. The bar graphs indicate the average monthly precipitation in millimeters.



- 442) For what two cities in the given graphs is the winter precipitation most likely to be snow?
- A) *B* and *C* C) *A* and *B*
 B) *B* and *D* D) *A* and *C*

- 443) In which one of the following sequences are the cities in the given graphs listed in order of decreasing average yearly precipitation?
- A) *A, B, C, D*
 B) *C, A, D, B*
 C) *D, C, B, A*
 D) *B, D, A, C*

Questions 444 and 445 refer to the following:

The table below shows weather conditions for 4 consecutive days at a location in New York State. Each reading was taken at 1 p.m.

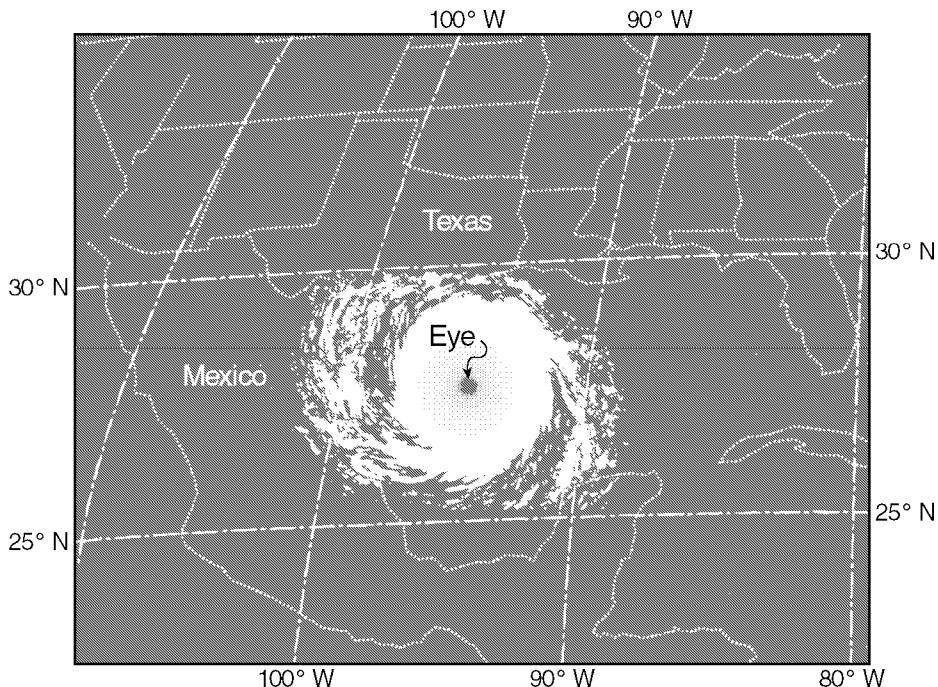
Day	Temperature ($^{\circ}\text{F}$)	Wind Speed, Wind Direction, Cloud Cover	Barometric Pressure (mb)	Present Weather
Monday	6		1,028.0	Clear
Tuesday	4		1,029.0	Sunny
Wednesday	24		1,017.0	Light snow
Thursday	26		1,011.0	Light snow

- 444) Which type of air mass was most likely over New York State on Monday and Tuesday?
- A) **mP** C) **cT**
 B) **cP** D) **mT**

- 445) On which two days was the relative humidity probably *highest*?
- A) Tuesday and Wednesday
 B) Thursday and Monday
 C) Wednesday and Thursday
 D) Monday and Tuesday

Questions 446 through 449 refer to the following:

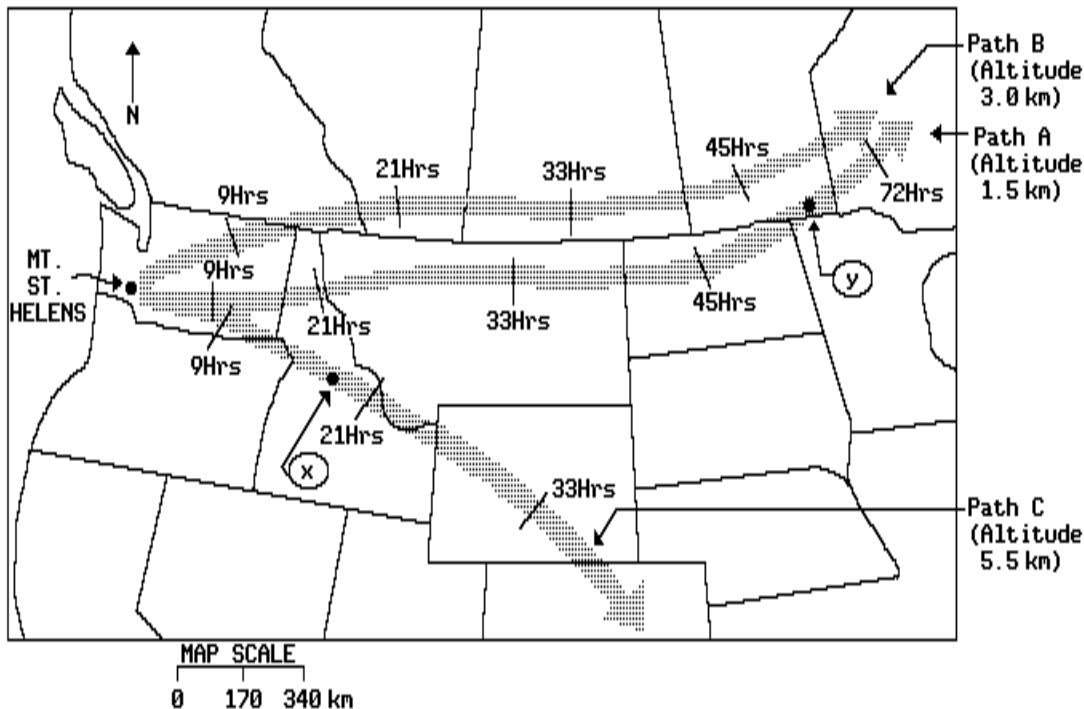
The weather satellite photograph of a portion of the United States and Mexico shows the clouds of a major hurricane approaching the eastern coastline of Texas and Mexico. The calm center of the hurricane, the eye, is labeled.



- 446) (a) State *two* dangerous conditions, other than hurricane winds, that could cause human fatalities as the hurricane strikes the coast.
(b) Describe *one* emergency preparation humans could take to avoid a problem caused by one of these dangerous conditions.
- 447) Cloud droplets form around small particles in the atmosphere. Describe how the hurricane clouds formed from water vapor. Include the terms "dewpoint" and either "condensation" or "condense" in your answer.

- 448) At the location shown in the photograph, the hurricane had maximum winds recorded at 110 miles per hour. Within a 24-hour period, the hurricane moved 150 miles inland and had maximum winds of only 65 miles per hour. State why the wind velocity of a hurricane usually decreases when the hurricane moves over a land surface.

- 449) This hurricane has a pattern of surface winds typical of all low-pressure systems in the Northern Hemisphere. On the given satellite photograph, draw *three* arrows on the clouds to show the direction of the surface wind movement outside the eye of the hurricane.
- 450) One eruption of Mt. St. Helens in Washington State resulted in the movement of volcanic ash across the northwestern portion of the United States. The map shows the movement of the ash along paths at three different altitudes above sea level: path *A* at 1.5 km, path *B* at 3.0 km, and path *C* at 5.5 km. The lines across each path indicate the time interval between the eruption and the position of the leading edge of ash. Points *X* and *Y* are places on the Earth's surface.

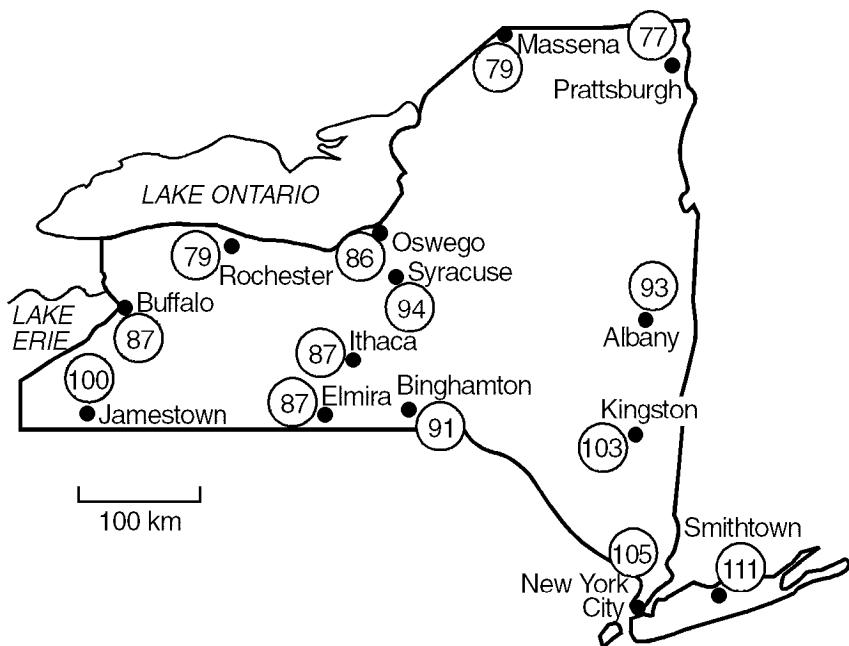


Why did the general direction of the ash front along path *C* *not* follow the general direction of the ash fronts along path *A* and path *B*?

- A) Northwest winds existed at the 5.5-kilometer level.
- B) The eruption threw material toward the southeast.
- C) Only the ash along path *C* was effected by the Earth's rotation.
- D) Mountain ranges southeast of the volcano are 1.5 kilometers high.

Questions 451 and 452 refer to the following:

The map below shows average annual amounts of precipitation in centimeters for several selected locations within New York State.

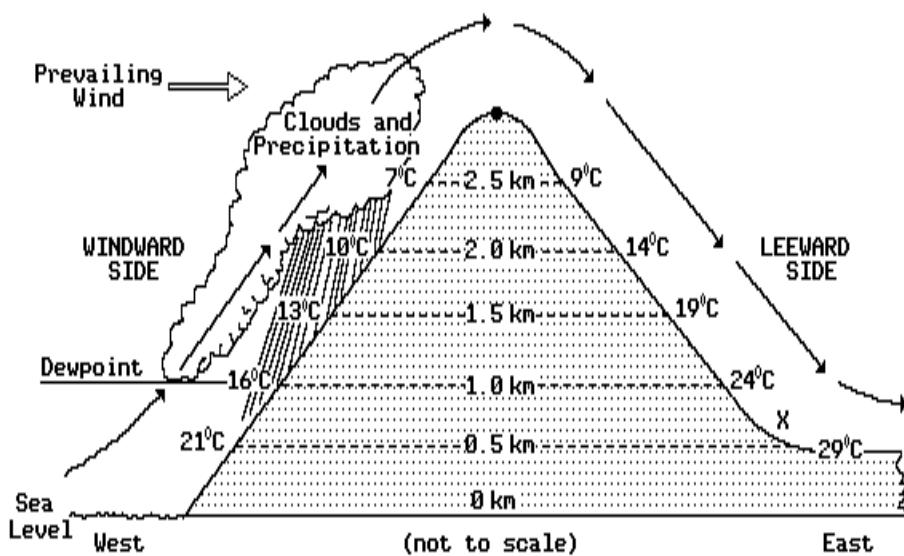


- 451) Locations on Long Island usually have greater average annual precipitation than locations near Massena because Long Island
- is located in the prevailing westerlies wind belt
 - has a high population density
 - is primarily a flat plain
 - has a large source of moisture nearby

- 452) Which statement *best* explains why Plattsburgh receives the *lowest* average annual precipitation?
- Prevailing winds travel over the Adirondack Mountains before they reach Plattsburgh.
 - A planetary low-pressure belt is located over Plattsburgh.
 - High latitudes cause a warm, dry climate near Plattsburgh.
 - Ocean currents bring warm, moist air to Plattsburgh.

Questions 453 through 457 refer to the following:

The diagram below shows a mountain. The prevailing wind direction and air temperatures at different elevations on both sides of the mountain are indicated.



- 453) Which feature is probably located at the base of the mountain on the leeward side (location X)?
- a jungle
 - a glacier
 - an arid region
 - a large lake
- 454) How does the temperature of the air change as the air rises on the windward side of the mountain between sea level and 0.5 kilometer?
- The air is cooling due to expansion of the air.
 - The air is warming due to expansion of the air.
 - The air is cooling due to compression of the air.
 - The air is warming due to compression of the air.

- 455) The air temperature on the leeward side of the mountain at the 1.5-kilometer level is higher than the temperature at the same elevation on the windward side. What is the probable cause for this?
- The air on the windward side of the mountain has a lower adiabatic lapse rate than the air on the leeward side of the mountain.
 - The insolation received at sea level is greater on the leeward side of the mountain.
 - Potential energy is lost as rain runs off the windward side of the mountain.
 - Heat stored in the ocean keeps the windward side of the mountain warmer.

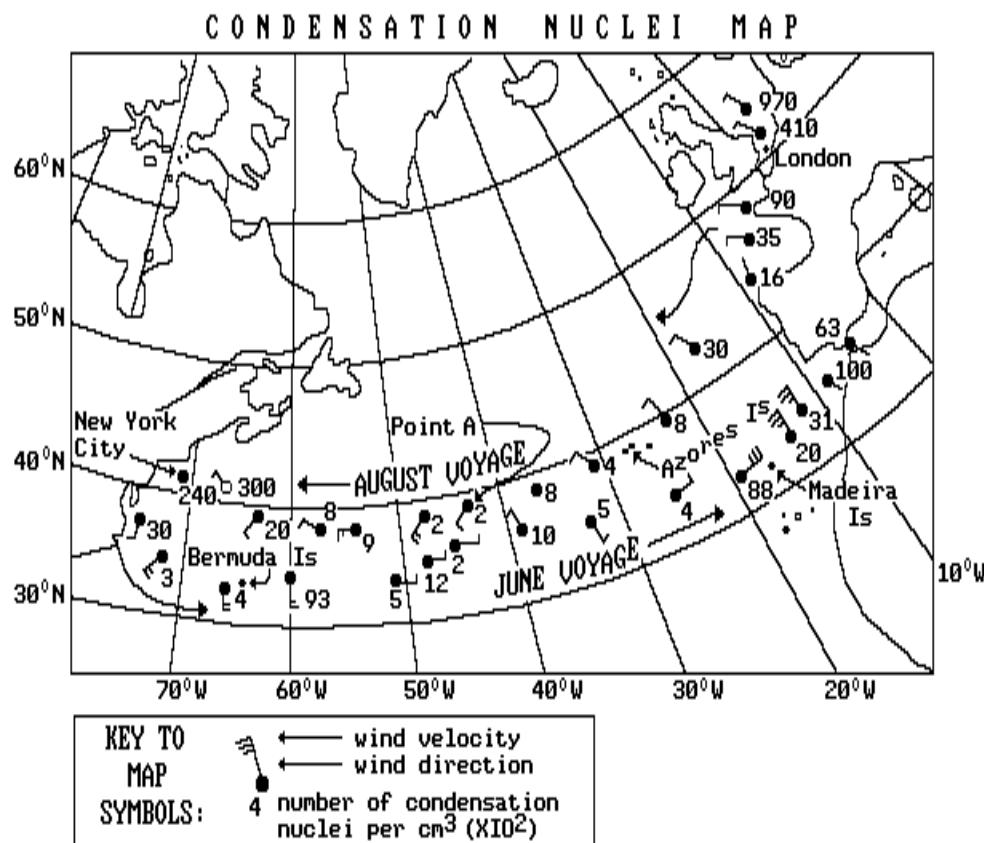
- 456) What would be the approximate air temperature at the top of the mountain?

A) 10DC C) 0DC
B) 4DC D) 12DC

- 457) On which side of the mountain and at which elevation is the relative humidity probably 100%?

A) on the leeward side at 1.0 km
B) on the windward side at 1.5 km
C) on the leeward side at 2.5 km
D) on the windward side at 0.5 km

- 458) The map below shows the number of condensation nuclei measured during two ship voyages across the Atlantic Ocean, one in June and the other in August.

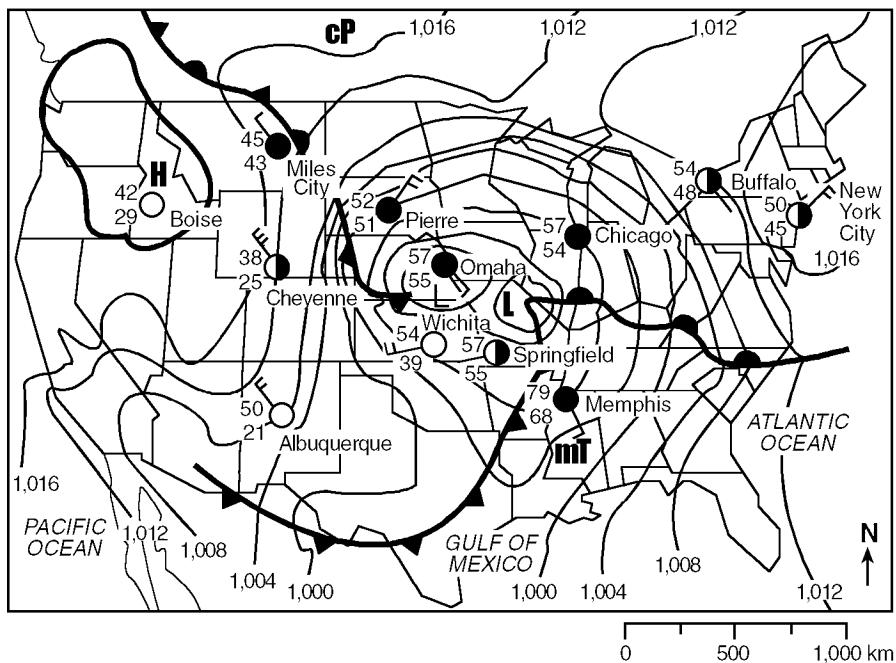


What was observed on the June crossing between longitudes 20°W and 10°W?

- A) the lowest counts of condensation nuclei
B) decreasing ocean water temperatures
C) the highest wind velocities measured
D) increasing air pressure

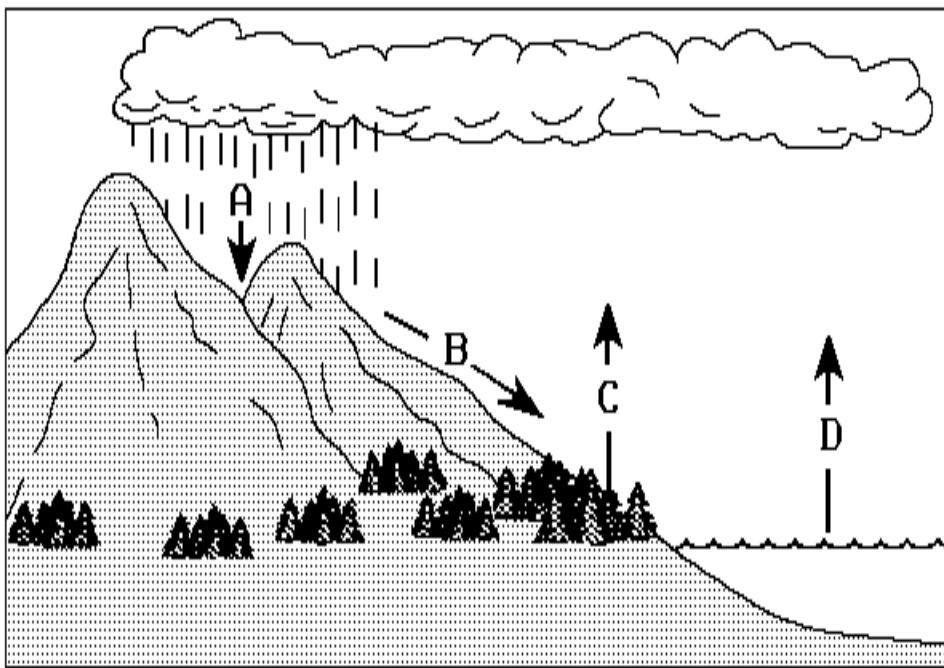
Questions 459 through 463 refer to the following:

The diagram below represents a weather map.



- 459) The air mass over Memphis, Tennessee, most likely originated in
- the North Pacific
 - the Gulf of Mexico
 - central Canada
 - the central United States
- 460) The weather front west of Memphis, Tennessee, is moving at a speed of 50 kilometers per hour. What is the most likely weather forecast for Memphis for the next 12 hours?
- showers followed by warm, humid conditions
 - showers followed by clearing skies and cooler temperatures
 - clearing skies followed by warm, dry conditions
 - a continuation of the present weather conditions
- 461) Which kind of frontal system is located northwest of Miles City, Montana?
- cold front
 - occluded front
 - stationary front
 - warm front
- 462) According to the map, at which city is precipitation most likely occurring?
- Albuquerque, New Mexico
 - New York City
 - Boise, Idaho
 - Omaha, Nebraska
- 463) If the low-pressure systems follow the path of most weather systems in the United States, in which direction will they move?
- southeast
 - northwest
 - northeast
 - southwest

- 464) A diagram of the water cycle is shown below. Letters *A* through *D* represent the processes taking place.

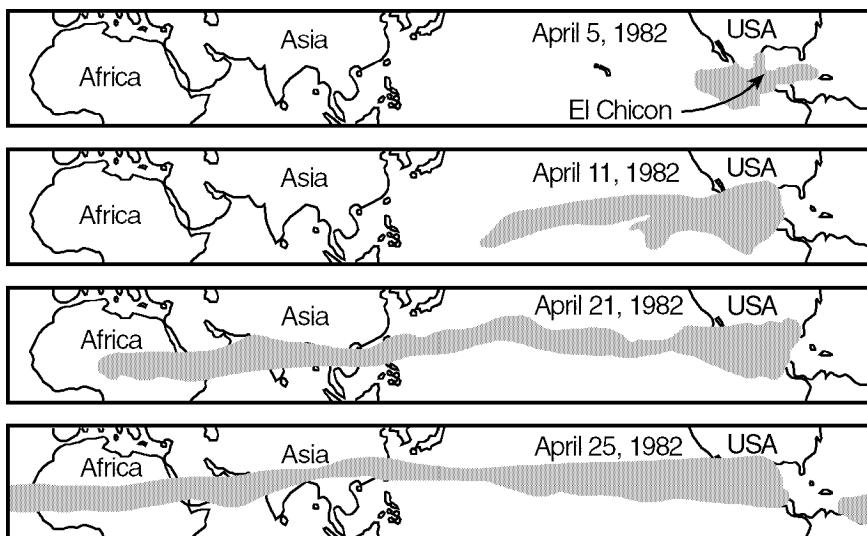


Which arrow represents the process of transpiration?

- A) C B) A C) D D) B

Questions 465 through 467 refer to the following:

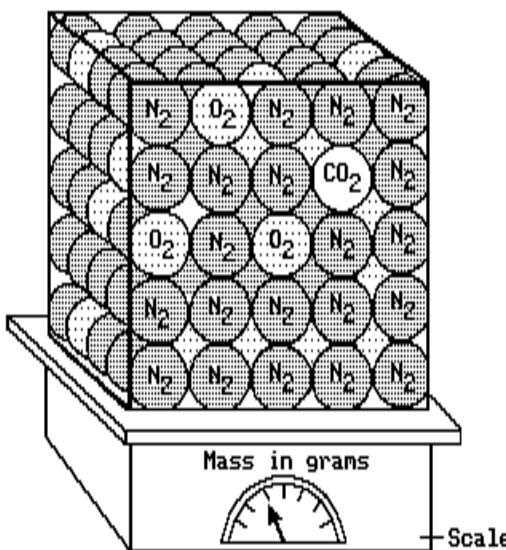
The maps below show the spread of a volcanic ash cloud from the 1982 eruption of El Chicon in Mexico, as seen from weather satellites.



- 465) State the most likely effect of the ash cloud on the temperature of areas under the cloud on April 25, 1982.
- 466) State what caused the *main* ash cloud to spread in the pattern shown on the map of April 25, 1982.

Questions 468 through 471 refer to the following:

The diagram below represents a model that shows how air density is affected by the addition of water vapor to the air. Marbles with different masses, representing nitrogen, oxygen, and carbon dioxide, were used to fill a container to show a certain volume of dry air. The container was placed on a scale to find the mass of this volume of dry air.



MOLECULE SYMBOL	GAS	MASS
N_2	Nitrogen	28 g
O_2	Oxygen	32 g
CO_2	Carbon Dioxide	44 g
H_2O	Water Vapor	18 g

A few marbles representing nitrogen (N_2) and oxygen (O_2) were removed and replaced with marbles representing water vapor (H_2O) to show the same volume of air with water vapor present. The relative mass of each gas, as represented by the marbles, is shown in the data table.

- 468) According to the data table, which gas molecule has the *least* mass?

- A) oxygen
- B) water vapor
- C) nitrogen
- D) carbon dioxide

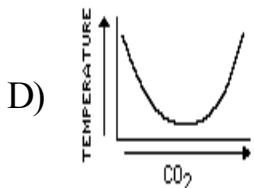
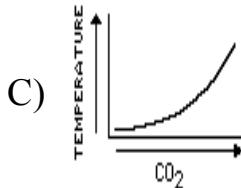
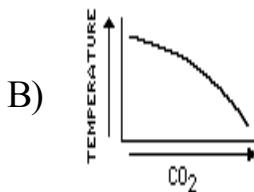
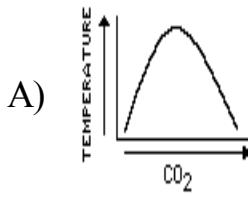
- 469) After water vapor molecules enter the Earth's atmosphere, what conditions must occur before they can become liquid?

- A) warming temperatures and condensation
- B) cooling temperatures and condensation
- C) cooling temperatures and evaporation
- D) warming temperatures and evaporation

- 470) When a few of the marbles representing nitrogen and oxygen are replaced with marbles representing water vapor, the air model will become

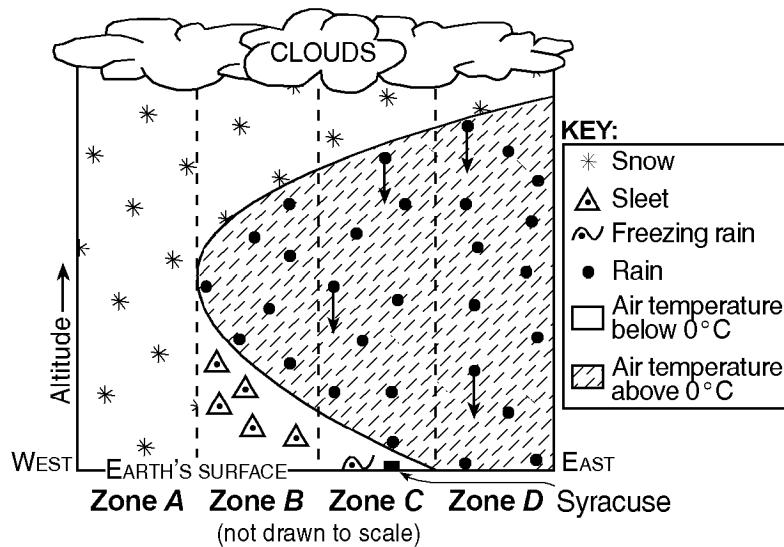
- A) heavier and less dense
- B) lighter and less dense
- C) heavier and more dense
- D) lighter and more dense

- 471) Which graph best represents what most likely happens to the temperature of the Earth's atmosphere as the amount of carbon dioxide in the atmosphere increases over a period of many years?



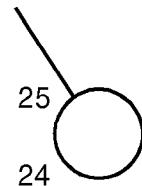
Questions 472 through 475 refer to the following:

The atmospheric cross section below represents a winter storm system. Zones A, B, C, and D are located on a west to east line at approximately 43°N latitude across New York State. This cross section shows how solid and liquid forms of precipitation depend on the air temperature above Earth's surface. The storm is moving from west to east.



- 472) At the time of the events represented by the given cross section, Syracuse, New York, is experiencing the following weather conditions:

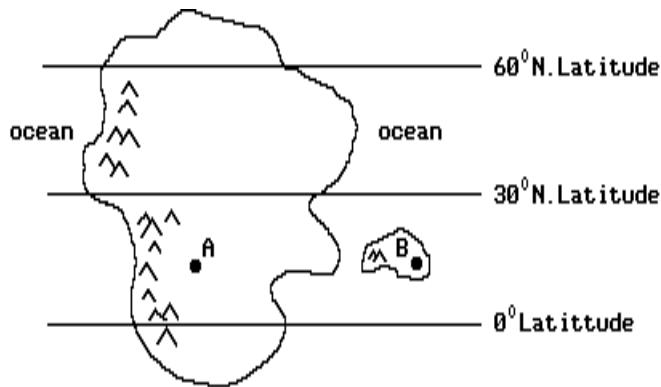
Cloud cover	100%
Wind speed	15 knots
Present weather	Freezing rain
Precipitation	1.23 inches past 6 hours
Visibility	1 mile



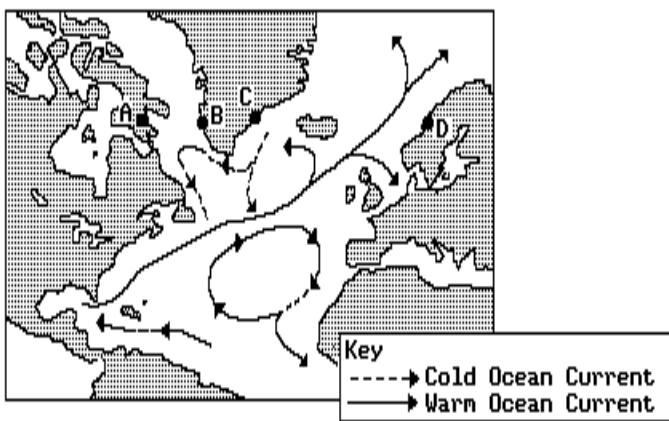
The temperature, dewpoint, and wind direction are shown on the weather station model above. Using proper format, add the information shown in the table to the model.

- 473) Describe the general air movement and temperature change that caused the clouds associated with the storm shown in the diagram to form.
- 474) Explain why sleet is occurring in Zone B in the given diagram.

- 475) As the storm in the given diagram moves eastward, the type of precipitation received in Syracuse changes. State the type of precipitation that will immediately follow freezing rain.
- 476) The diagram below represents an imaginary continent and a nearby island.



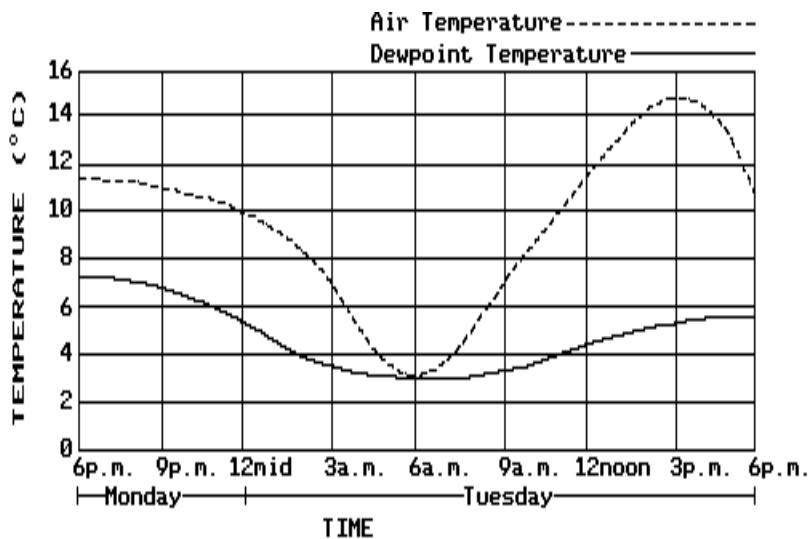
- Which climatic variable causes location *A* to have cooler winters and warmer summers than location *B*?
- direction of the planetary winds
 - distance from a large body of water
 - location of mountain barriers
 - latitude
- 477) The map below shows the general path of ocean currents in a portion of the Northern Hemisphere. Locations *A*, *B*, *C*, and *D*, are at the shoreline.



- Which location most likely has the warmest climate?
- B*
 - C*
 - D*
 - A*

Questions 478 through 481 refer to the following:

The graph below shows the air temperature and dewpoint temperature over a 24-hour period for a location in New York State.



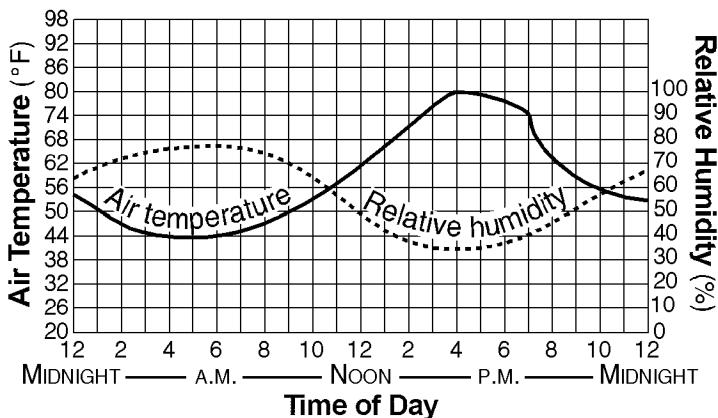
- 478) If the trends shown continued, the air temperature at 7 p.m. Tuesday was probably about
- A) 14°C
 - B) 8°C
 - C) 11°C
 - D) 2°C
- 479) The air's capacity to hold water vapor was *greatest* at
- A) 6 p.m. Monday
 - B) 6 a.m. Tuesday
 - C) 3 p.m. Tuesday
 - D) 12 noon Tuesday
- 480) When was the air at ground level saturated with water vapor?
- A) 3 p.m. Tuesday
 - B) 12 noon Tuesday
 - C) 6 p.m. Monday
 - D) 6 a.m. Tuesday

- 481) According to the weather map information in the *Earth Science Reference Tables*, which weather station model best represents the weather conditions at this location at 9 p.m. on Monday?

- A)
- B)
- C)
- D)

Questions 482 and 483 refer to the following:

The graph below shows air temperature and relative humidity at a single location during a 24-hour period.



- 482) What was the approximate change in relative humidity from 12 noon to 4 p.m.?
- A) 30% C) 15%
B) 10% D) 20%
- 483) At which time would the rate of evaporation most likely be *greatest*?
- A) 6 a.m. C) 11 p.m.
B) 10 a.m. D) 4 p.m.
- 484) The data table below shows the air pressures and air temperatures collected by nine observers at different elevations on the same side of a high mountain. The data was collected at 12:00 noon on a clear, calm day.

Station	Elevation (m)	Air Pressure (mb)	Air Temperature (°C)
1	SEA LEVEL	1,000	22
2	200	980	20
3	400	960	18
4	600	940	16
5	800	920	14
6	1,000	900	12
7	1,200	880	10
8	1,400	860	9
9	1,600	840	8

The change in temperature between station 1 and station 9 is most likely due to modification of temperature patterns by

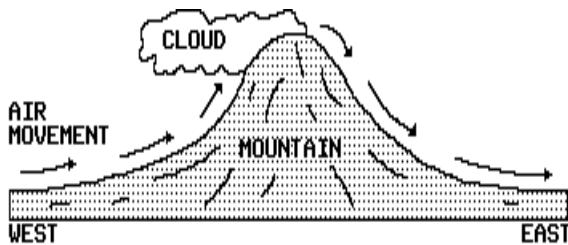
- A) latitudes
B) elevation above sea level
C) planetary wind belts
D) ocean currents

- 485) In the cartoon below, Calvin makes a wish.

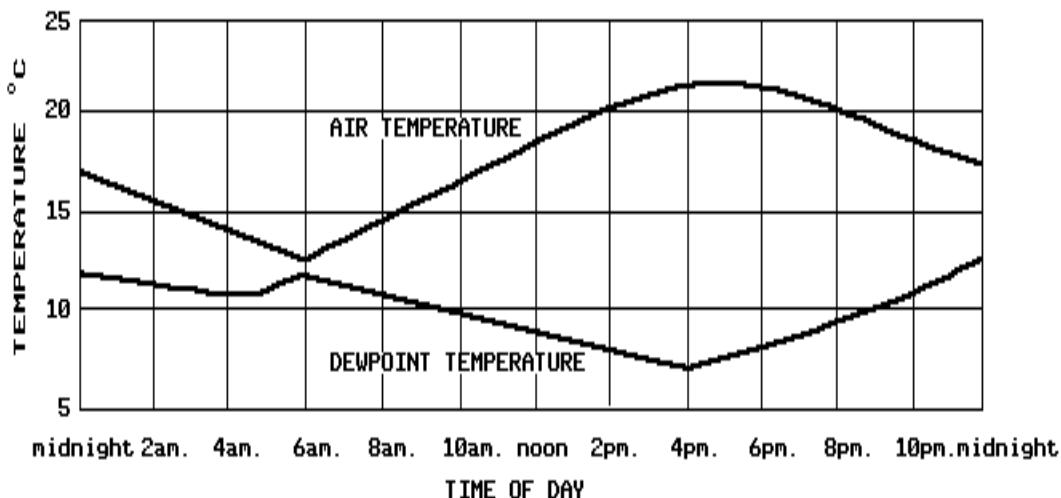


Which statement *best* explains why Calvin's wish did *not* come true?

- A) The clouds in the area lacked water droplets.
 B) The relative humidity was too low for snow.
 C) The atmospheric temperature was well above 0°C.
 D) The temperature was below the dewpoint.
- 486) Which statement best explains why a cloud is forming as shown in the diagram below?



- A) Water vapor is condensing.
 B) Moisture is evaporating.
 C) Cold air rises and compresses.
 D) Warm air sinks and expands.
- 487) The graph below shows the changes in air temperature and dewpoint temperature over a 24-hour period at a particular location. At what time was the relative humidity lowest?

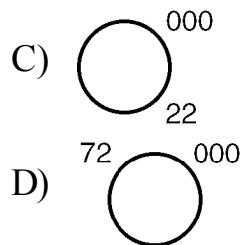
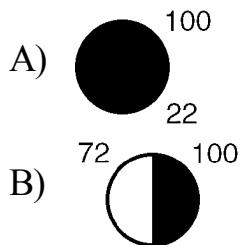


- A) 10 a.m.
 B) midnight
 C) 6 a.m.
 D) 4 p.m.

- 488) The data table below shows the air pressures and air temperatures collected by nine observers at different elevations on the same side of a high mountain. The data was collected at 12:00 noon on a clear, calm day.

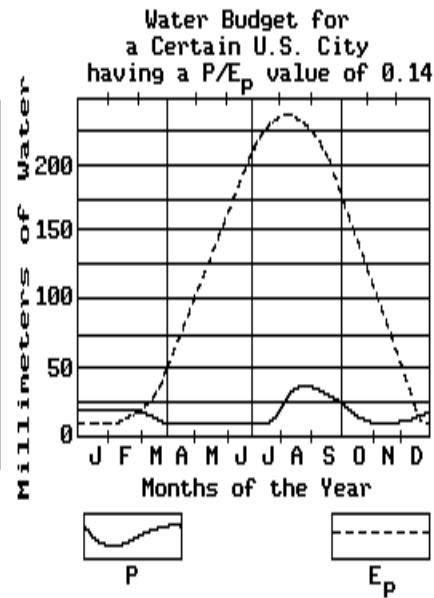
Station	Elevation (m)	Air Pressure (mb)	Air Temperature ($^{\circ}\text{C}$)
1	SEA LEVEL	1,000	22
2	200	980	20
3	400	960	18
4	600	940	16
5	800	920	14
6	1,000	900	12
7	1,200	880	10
8	1,400	860	9
9	1,600	840	8

Which station model *best* represents weather conditions at station 1 at this time?



- 489) The table below gives information about five United States cities and the graph shows the water budget for one of the five cities.

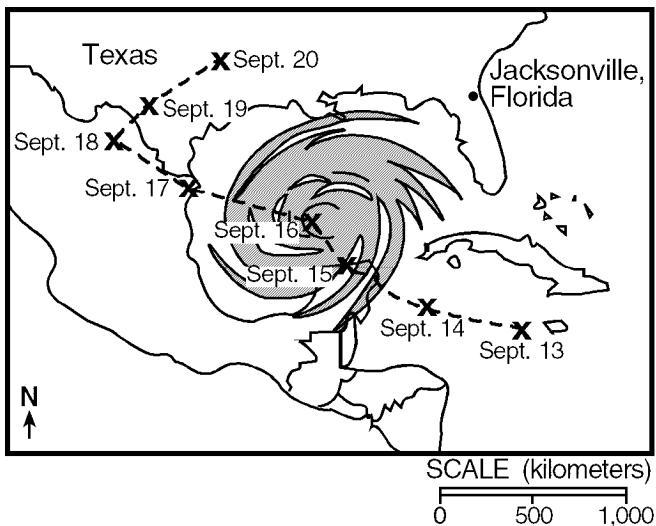
Climate Data for Certain U.S. Cities		
City	Total Annual Precipitation (in mm) P	Total Annual Potential Evapotranspiration (in mm) E_p
R	194	1340
S	291	434
T	708	877
X	825	621
Z	859	1035



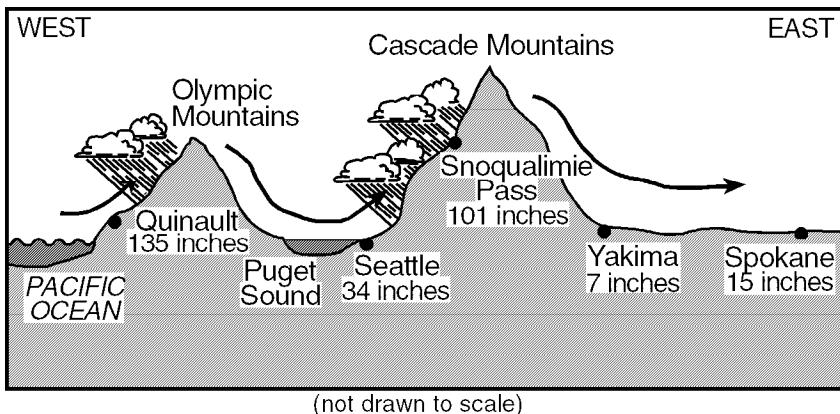
The city described by the graph is located on the leeward side of a mountain. Another city is located at the same latitude and elevation on the windward side of the same mountain. How would the climate of the city represented by the graph probably compare to the climate of the other?

- A) more humid and cooler
 B) drier and cooler
 C) drier and warmer
 D) more humid and warmer

- 490) The diagram below represents a satellite image of Hurricane Gilbert in the Gulf of Mexico. Each X represents the position of the eye of the storm on the date indicated.



The general direction of Hurricane Gilbert's track from September 13 through September 18 was toward the

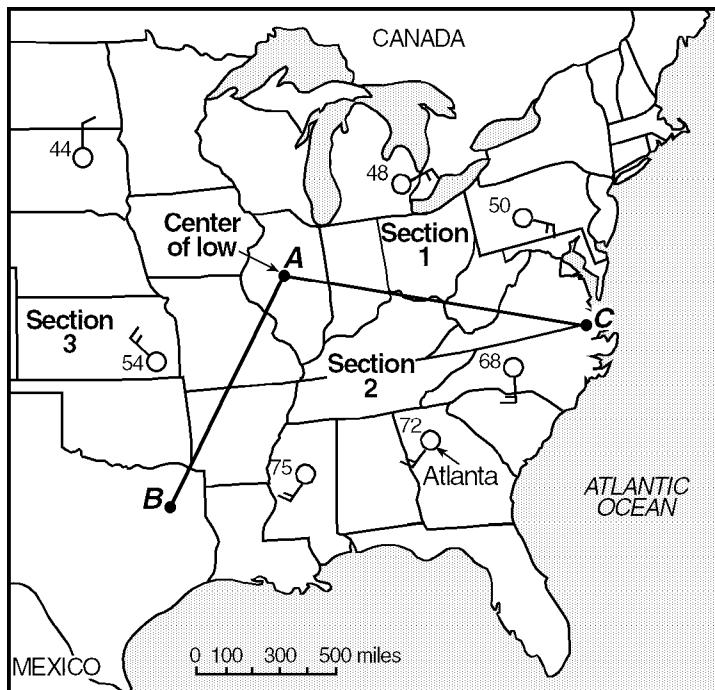


Why do the windward sides of these mountain ranges receive more precipitation than the leeward sides?

- A) Rising air compresses and cools.
 - B) Sinking air compresses and cools.
 - C) Rising air expands and cools.
 - D) Sinking air expands and cools.

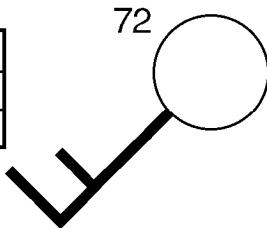
Questions 492 through 494 refer to the following:

The weather map below shows partial weather data for several weather stations. Point A is the center of a low-pressure system. Lines AB and AC represent the frontal boundaries between different air masses.



- 492) Atlanta, Georgia, has the following additional weather variable measurements.

Visibility	6 miles
Amount of cloud cover	1/2 or 50%
Air pressure	1001.1 millibars



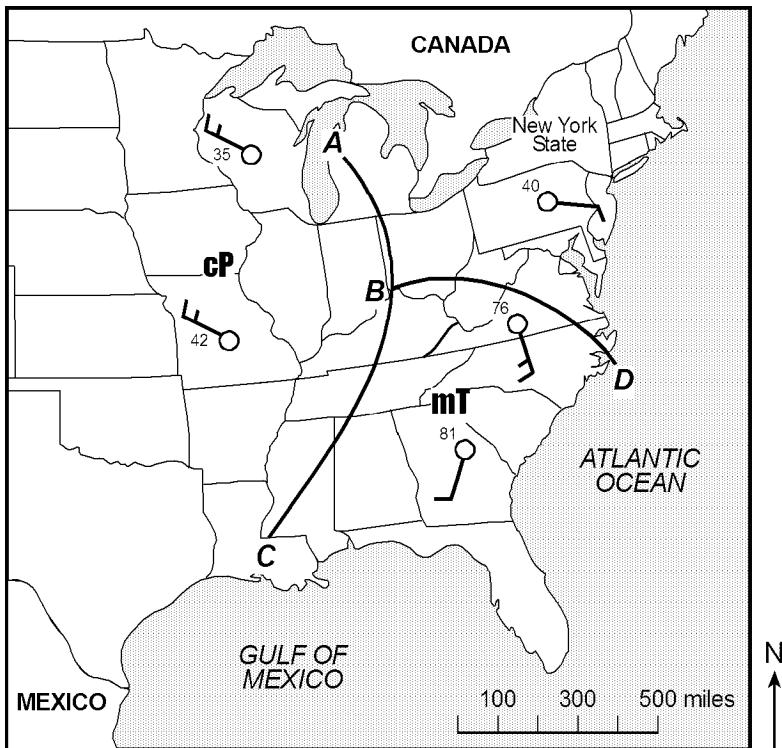
On the station model above, place these *three* weather measurements in their correct location using the proper format.

- 493) On the given map, draw the correct weather map symbols for the *two* different fronts located on lines AB and AC. The symbols must show the direction the fronts are moving.

- 494) In each of the *three* map sections shown (Section 1, Section 2, and Section 3), draw curved arrows to represent the general direction that surface winds will move in association with the center of the low-pressure system at location A.

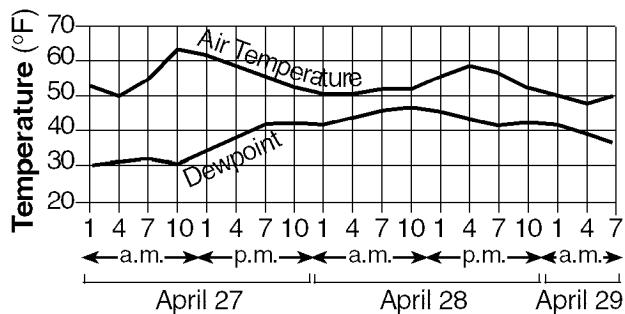
Questions 495 through 497 refer to the following:

The weather map below shows a low-pressure system over part of North America. Five weather stations are shown on the map. Lines AB, BC, and BD represent surface frontal boundaries. Line AB represents an occluded front that marks the center of a low-pressure system. Symbols **cP** and **mT** represent different air masses.



- 495) Other than low pressure, state *two* weather conditions associated with a low-pressure center.
- 496) Name the geographic region over which the **mT** air mass most likely formed.
- 497) On the weather map, place the proper front symbols on lines AB, BC, and BD. Place the front symbols on the correct side of each line to show the direction of front movement.

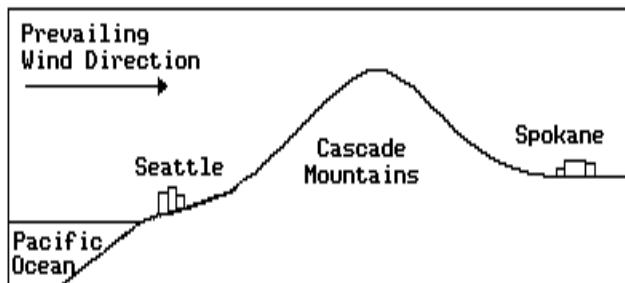
- 498) The graph below is a computer-generated forecast of air temperature and dewpoint for a city during a period of 2[days.



At what time during this period is the rate of evaporation expected to be *highest*?

- A) April 28 at 4 p.m. C) April 27 at 10 a.m.
B) April 29 at 4 a.m. D) April 28 at 10 a.m.

- 499) The diagram below shows the position of the cities of Seattle and Spokane, Washington. Both cities are located at approximately 48° North latitude, and they are separated by the Cascade Mountains.

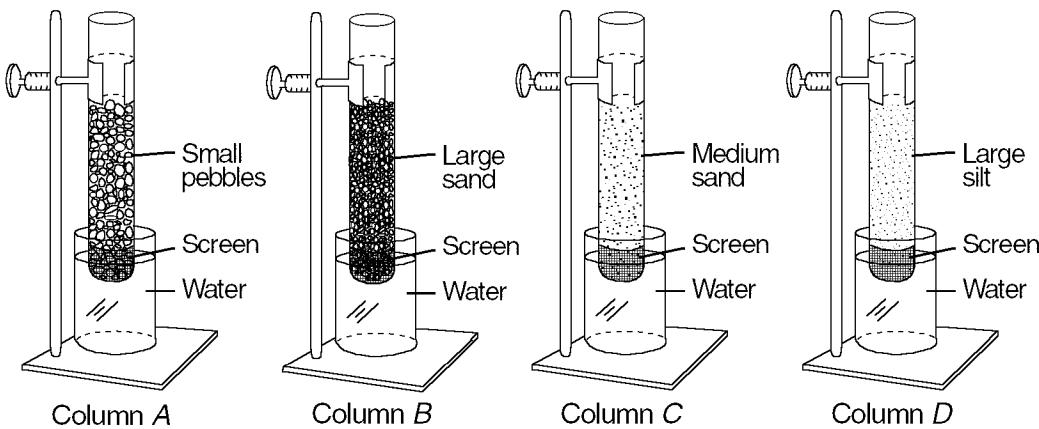


How does the climate of Seattle compare with the climate of Spokane?

- A) Seattle is hot and humid
Spokane is cool and dry
 - B) Seattle is cool and humid
Spokane is warm and dry
 - C) Seattle is hot and dry
Spokane is cool and humid
 - D) Seattle is cool and dry
Spokane is warm and humid

Questions 500 through 502 refer to the following:

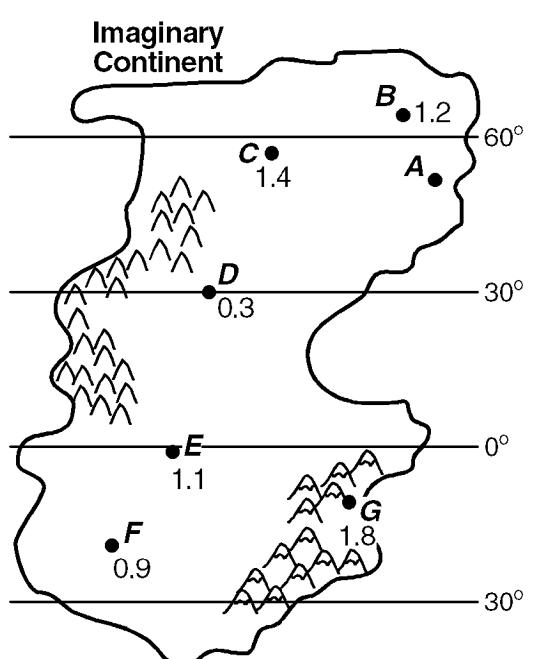
Columns A, B, C, and D are partially filled with different sediments. Within each column, the sediment is uniform in size. A fine wire mesh screen covers the bottom of each column to prevent the sediment from falling out. The lower part of each column has just been placed in a beaker of water. Sediment sizes are not drawn to scale.



- 500) In which sediment will capillary action cause the water from the beaker to rise *fastest* in the column?
- small pebbles
 - large silt
 - medium sand
 - large sand
- 501) In an experiment, the beakers of water were removed and replaced with empty beakers. The sediments were allowed to dry. Then water was poured into each column to compare the permeability of the sediments. The permeability rate of the medium sand sample was shown to be
- greater than the silt sample but less than the pebble sample
 - less than the silt and pebble samples
 - less than the silt sample but more than the pebble sample
 - greater than the silt and pebble samples
- 502) Which column contains sediment with an average diameter *closest* to 0.1 centimeter?
- A
 - B
 - C
 - D

Questions 503 and 504 refer to the following:

The map below represents an imaginary continent on the Earth. Letters *B* through *G* are locations on the map for which climate ratios are given. The climate ratio is determined by dividing the average yearly precipitation by the average yearly potential evapotranspiration (P/E_p). The data table shows the monthly precipitation and potential evapotranspiration values for location *A*.



Climate Ratio (Yearly P/E_p)	Climate Type
Less than 0.4	Arid
0.4-0.8	Semiarid
0.8-1.2	Subhumid
Greater than 1.2	Humid

WATER BUDGET DATA FOR LOCATION *A* (mm)

	Precipitation (<i>P</i>)	Potential Evapotranspiration (<i>E_p</i>)
Jan.	68	5
Feb.	76	10
Mar.	89	35
Apr.	96	60
May	81	85
June	68	155
July	75	170
Aug.	71	159
Sept.	67	82
Oct.	65	60
Nov.	70	34
Dec.	63	10
TOTALS	889	865

- 503) Which climate condition is characteristic of *both* location *C* and location *D*?
- a large yearly temperature range
 - the same yearly potential evapotranspiration
 - the same number of months of moisture surplus
 - a large amount of yearly precipitation

- 504) Location *G* has a cold, humid climate. Which profile *best* represents the position of location *G* with respect to the mountains and the prevailing winds?

