

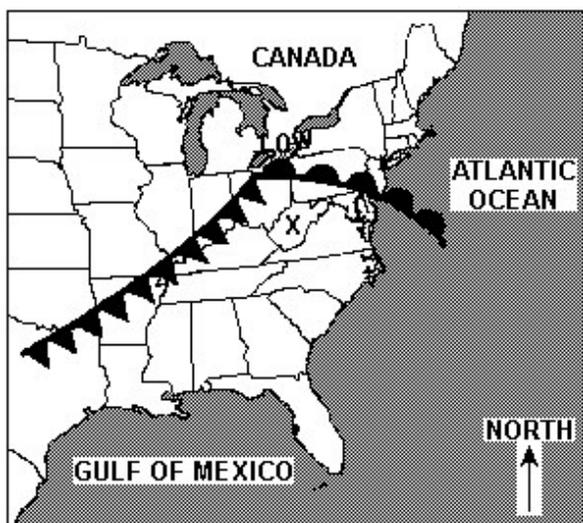
Castle Learning Review 1

1. Which process most directly results in cloud formation?
 1. condensation
 2. transpiration
 3. precipitation
 4. radiation

2. An air mass originating over north central Canada would most likely be
 1. warm and dry
 2. warm and moist
 3. cold and dry
 4. cold and moist

3. As warm, moist air moves into a region, barometric pressure readings in the region will generally
 1. decrease
 2. increase
 3. remain the same

4. The weather map shows a frontal system that has followed a typical storm track.



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

1. northern Atlantic Ocean
2. central part of Canada
3. Gulf of Mexico
4. Pacific Northwest

5. Which map below correctly shows the wind directions of the high-pressure and low-pressure systems?

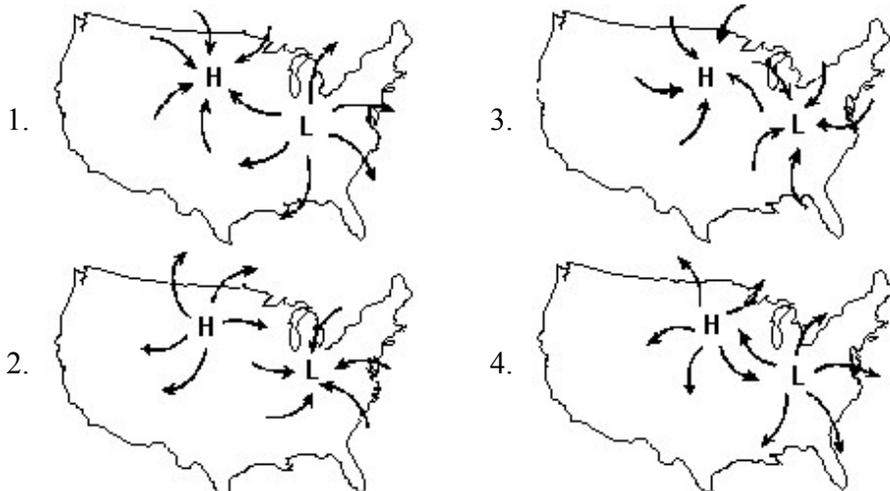
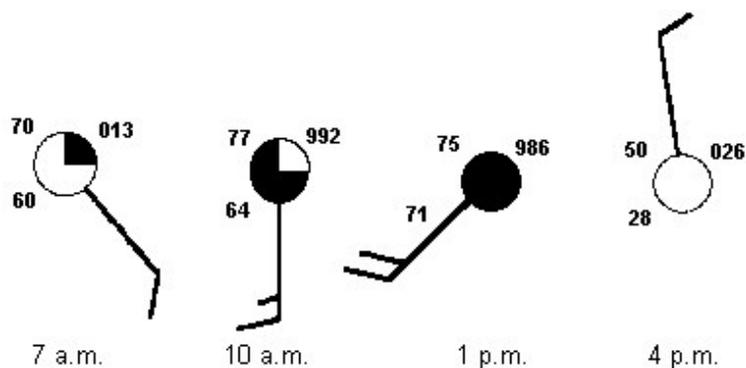


Figure 1

The diagrams represent station models showing weather data collected at four different times during one day at a location in the United States.



6. [Refer to figure 1]

What was the barometric pressure at 4 p.m.?

1. 26.0 mb
2. 260 mb
3. 1,002.6 mb
4. 1,026 mb

7. As altitude within the troposphere increases, the amount of water vapor generally

1. decreases, only
2. increases, only
3. remains the same
4. decreases, then increases

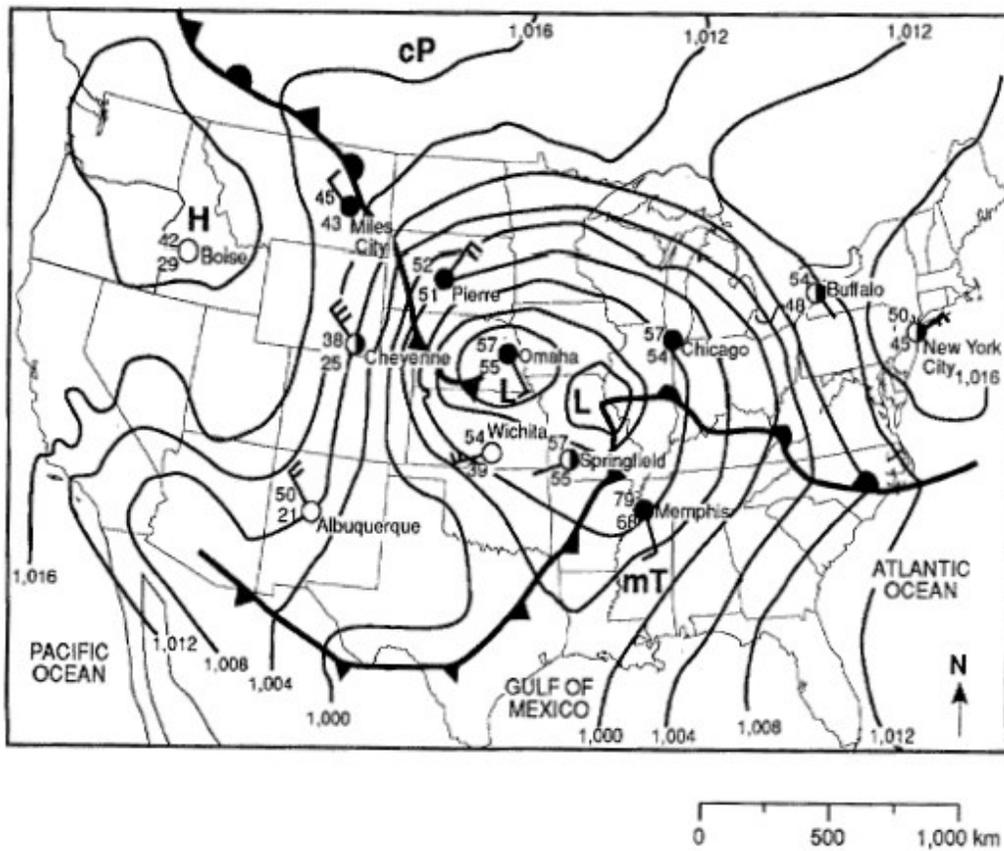
8. Which event will most likely occur in rising air?

1. clearing skies
2. cloud formation
3. decreasing relative humidity
4. increasing temperature

9. In the Northern Hemisphere, what is the direction of surface wind circulation in a high-pressure system?
1. clockwise and outward from the center
 2. clockwise and toward the center
 3. counterclockwise and outward from the center
 4. counterclockwise and toward the center
10. Which gas in the atmosphere has the most influence on day-to-day weather changes?
1. ozone
 2. oxygen
 3. water vapor
 4. carbon dioxide

Figure 2

The diagram shows a weather map of the United States.

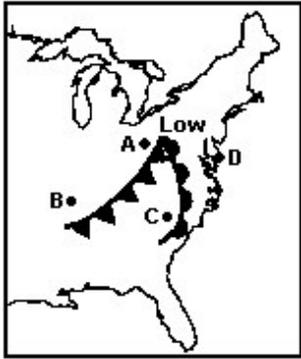


11. [Refer to figure 2]

If the low-pressure systems follow the path of most weather systems in the United States, in which direction will they move?

1. northwest
2. southwest
3. northeast
4. southeast

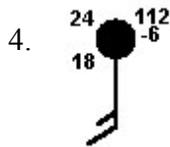
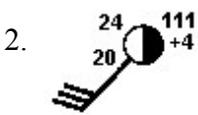
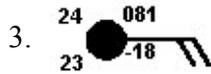
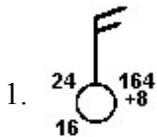
12. Cities *A*, *B*, *C*, and *D* on the weather map are being affected by a mid-latitude low-pressure system (cyclone).



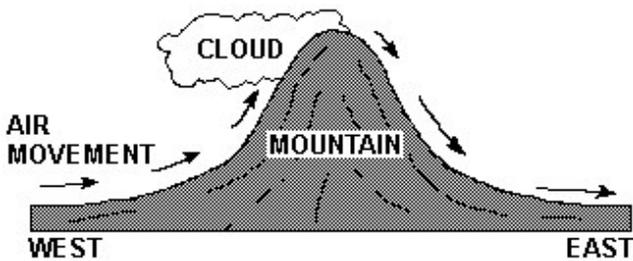
Which city is located in the warm air mass?

1. *A* 3. *C*
2. *B* 4. *D*

13. Which weather station model indicates the greatest probability of precipitation?



14. The diagram shows air moving over a mountain.



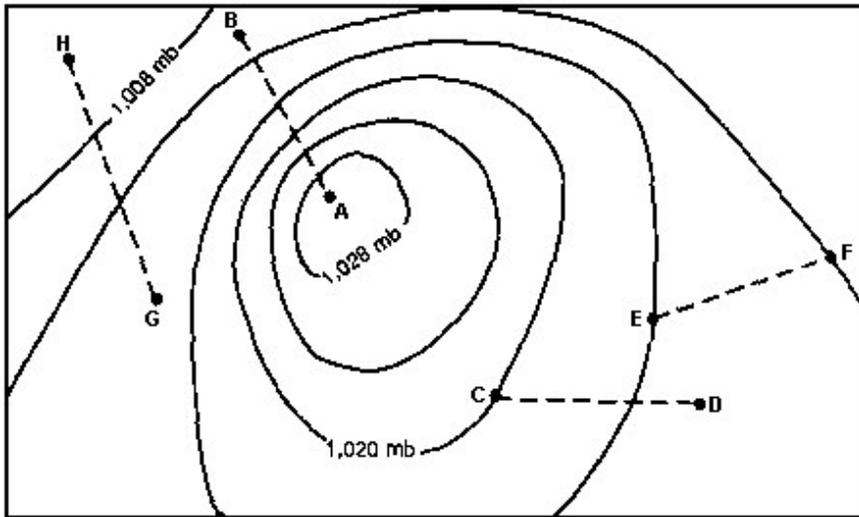
Which statement best explains why a cloud is forming as shown in the diagram?

1. Water vapor is condensing.
2. Moisture is evaporating.
3. Cold air rises and compresses.
4. Warm air sinks and expands.

15. A high-pressure center is generally characterized by
1. cool, wet weather
 2. cool, dry weather
 3. warm, wet weather
 4. warm, dry weather

Figure 3

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



16. [Refer to figure 3]

Along which dashed line would wind speeds be greatest?

1. *AB*
2. *EF*
3. *CD*
4. *GH*

17. Where is precipitation most likely to occur?

1. near the frontal surface between two air masses.
2. in descending air currents
3. on the leeward slopes of mountains
4. near the center of a high-pressure system

18. The characteristics of air masses depend chiefly upon the

1. rotation of Earth
2. surface over which the air mass was formed
3. barometric pressure of the air mass
4. wind velocity within the air mass

19. As a parcel of air moves up a mountainside and expands, the temperature of the air will
1. decrease
 2. increase
 3. remain the same

Figure 4

The data table contains 9 a.m. weather readings during a four-day period for a location in the eastern United States.

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

20. [Refer to figure 4]

On which day did precipitation most likely occur?

1. Monday
2. Tuesday
3. Wednesday
4. Thursday

21. Winds are blowing from high-pressure to low-pressure systems over identical ocean surfaces. Which diagram represents the area of greatest wind-speed? [Arrows indicate wind direction.]

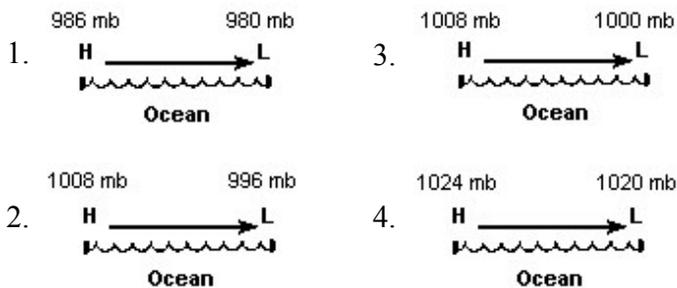
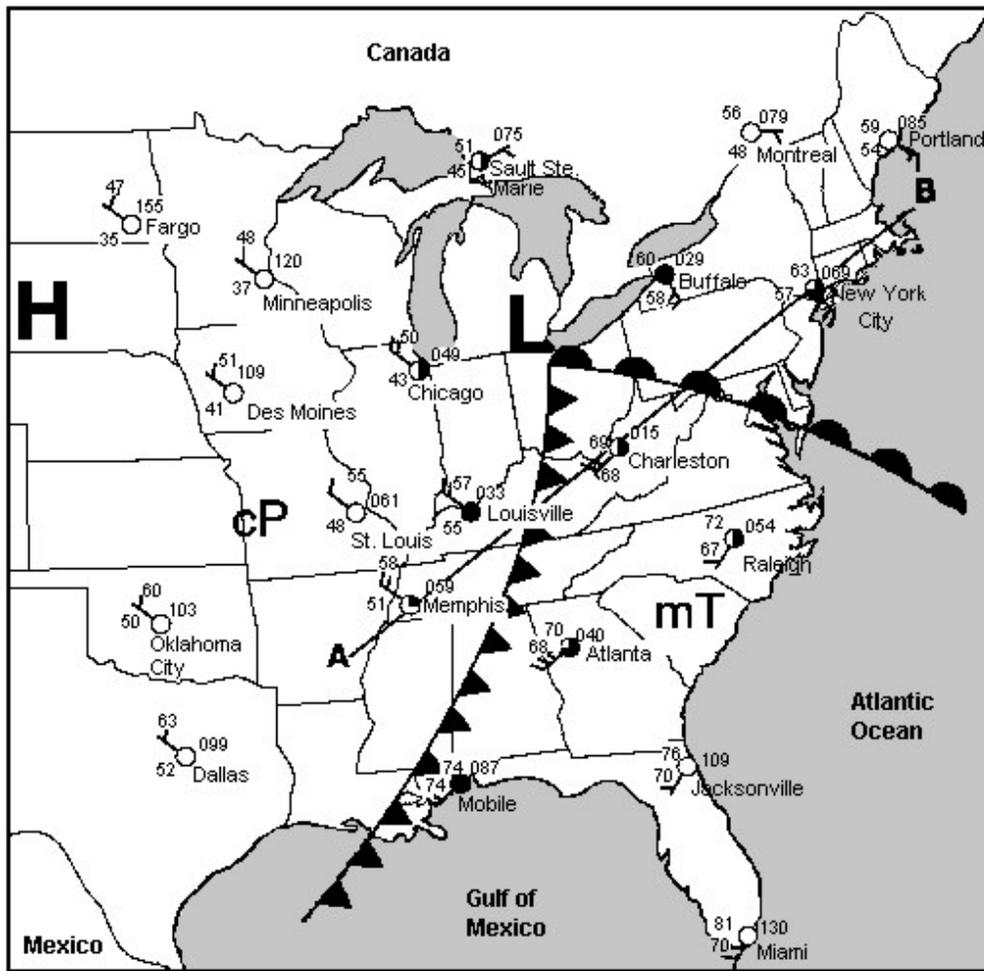


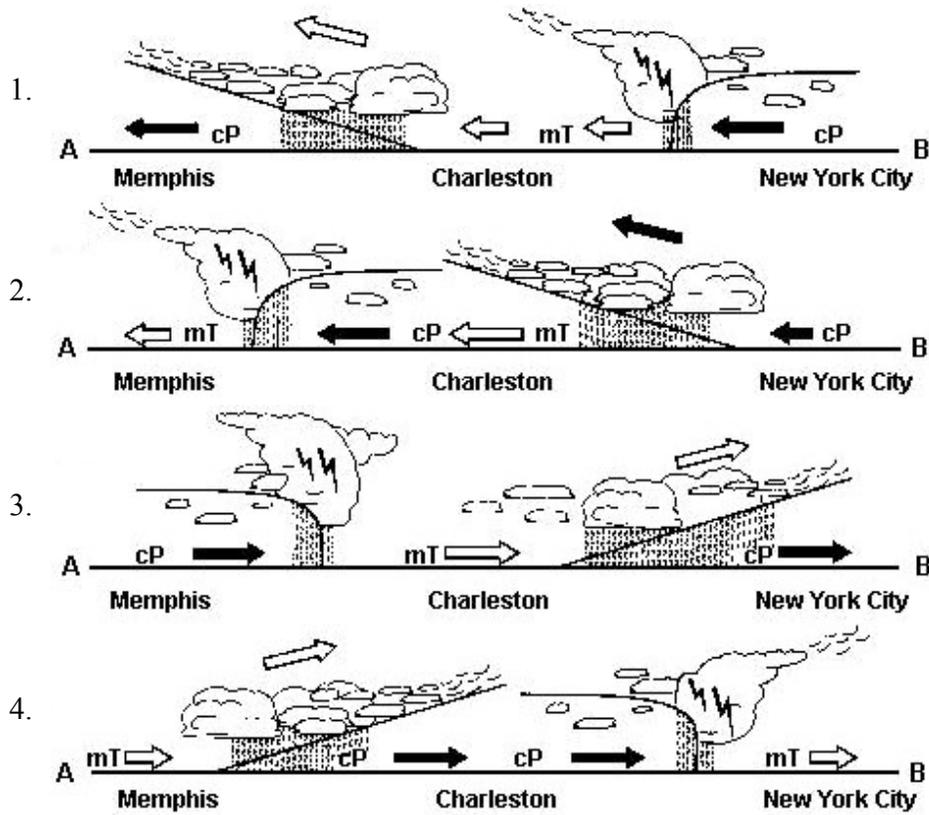
Figure 5

The map shows weather systems over the central and eastern United States and weather data for several cities.



22. [Refer to figure 5]

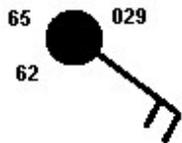
Which cross-sectional diagram of the lower atmosphere along line *AB* best represents the fronts and the movement of air masses?



23. A parcel of air has a dry-bulb temperature of 18°C and a wet-bulb temperature of 10°C. What is the relative humidity?

- 1. 19% 3. 33%
- 2. 8% 4. 28%

24. A station model is shown in the diagram.



What is the air pressure at this location?

- 1. 902.9 mb 3. 1029.0 mb
- 2. 1002.9 mb 4. 9029.0 mb

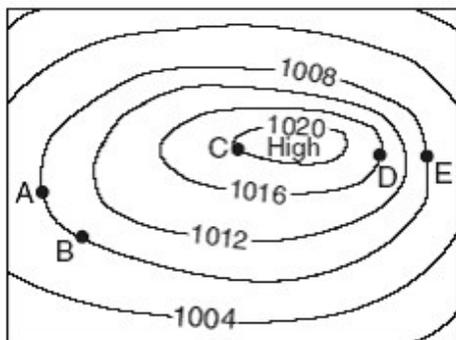
25. The primary reason that clouds rarely form in the stratosphere is that

- 1. no condensation nuclei are present in the stratosphere
- 2. very little water vapor is present in the stratosphere
- 3. ozone prevents the formation of clouds
- 4. the temperature is too high for clouds to form

26. When the dry-bulb temperature is 22°C and the wet-bulb temperature is 13°C, the relative humidity is

- 1. 10% 3. 41%
- 2. 33% 4. 59%

27. The air-pressure field map below represents a high-pressure system over the central United States. Isobars show the air pressure, in millibars. Letters *A* through *E* represent locations on Earth's surface.



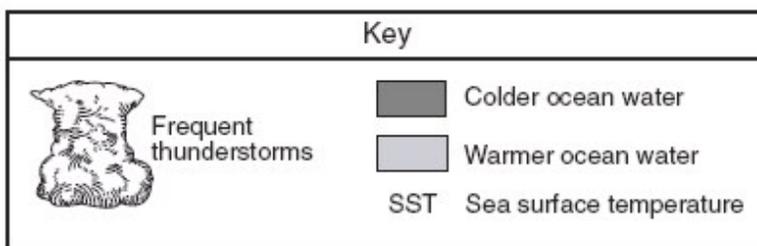
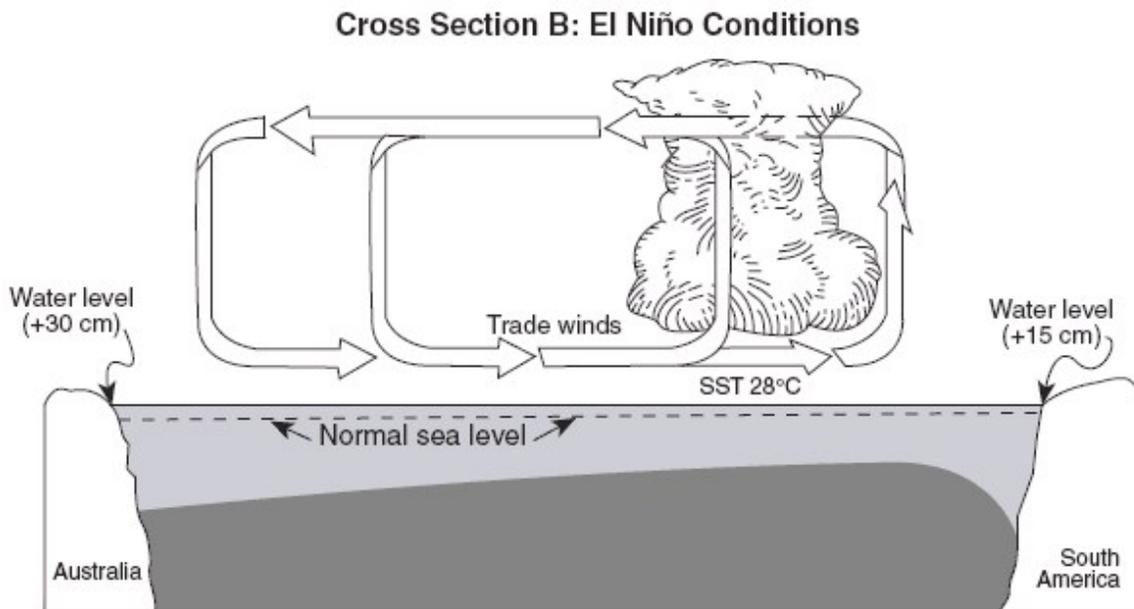
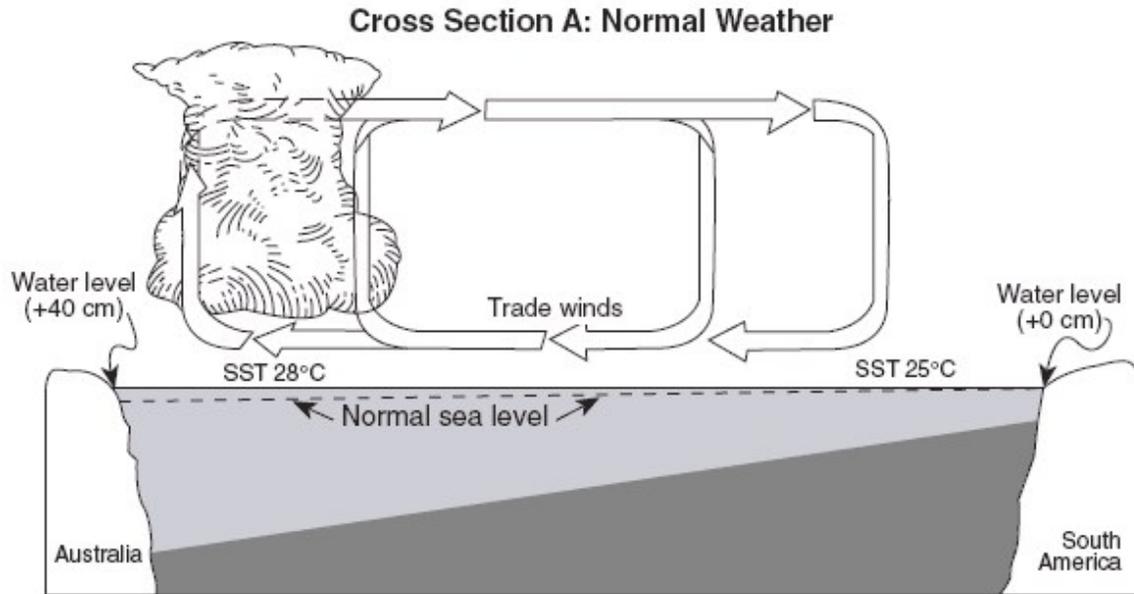
Between which two locations is the wind speed greatest?

- 1. *A* and *B* 3. *C* and *D*
- 2. *B* and *C* 4. *D* and *E*

28. Weather along most fronts is usually cloudy with precipitation because the warm air along most fronts is usually
1. sinking and cooling, causing water to evaporate
 2. sinking and warming, causing water to evaporate
 3. rising and cooling, causing water vapor to condense
 4. rising and warming, causing water vapor to condense

Figure 6

Base your answer on the two cross sections, which represent the Pacific Ocean and the atmosphere near the Equator during normal weather (cross section *A*) and during El Niño conditions (cross section *B*). Sea surface temperatures (SST) are labeled and trade-wind directions are shown with arrows. Cloud buildup indicates regions of frequent thunderstorm activity. The change from normal sea level is shown at the side of each diagram.



29. **[Refer to figure 6]**

During El Niño conditions, thunderstorms increase in the eastern Pacific Ocean region because the warm, moist air is

1. less dense, sinking, compressing, and warming
2. less dense, rising, expanding, and cooling
3. more dense, sinking, compressing, and warming
4. more dense, rising, expanding, and cooling

30. Which weather change is most likely indicated by rapidly falling air pressure?

1. Humidity is decreasing.
2. Temperature is decreasing.
3. Skies are clearing.
4. A storm is approaching.

Answer Key for Final Review 1

1. 1	11. 3	21. 2
2. 3	12. 3	22. 3
3. 1	13. 3	23. 3
4. 3	14. 1	24. 2
5. 2	15. 2	25. 2
6. 3	16. 1	26. 2
7. 1	17. 1	27. 4
8. 2	18. 2	28. 3
9. 1	19. 1	29. 2
10. 3	20. 2	30. 4