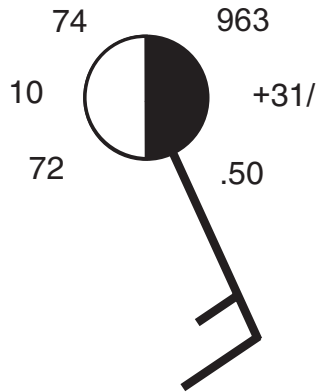


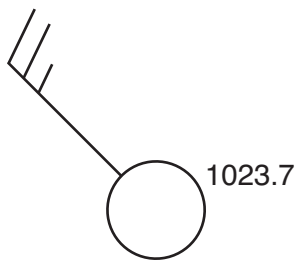
- 1 The station model below shows the weather conditions at Massena, New York, at 9 a.m. on a particular day in June.



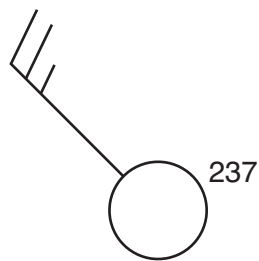
What was the barometric pressure at Massena 3 hours earlier on that day?

- (1) 993.2 mb                      (3) 1003.3 mb  
(2) 999.4 mb                      (4) 1009.1 mb
- 2 An air mass classified as cT usually forms over which type of Earth surface?
- (1) warm land                      (3) cool land  
(2) warm ocean                      (4) cool ocean
- 3 Which map view best shows the movement of surface air around a low-pressure system in the Northern Hemisphere?
- (1) (3)  
(2) (4)
- 4 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
- (1) a dense-fog warning  
(2) a high-wind advisory  
(3) a heat-index warning  
(4) an air-pollution advisory
- 5 Under which atmospheric conditions will water most likely evaporate at the fastest rate?
- (1) hot, humid, and calm  
(2) hot, dry, and windy  
(3) cold, humid, and windy  
(4) cold, dry, and calm
- 6 Which statement best explains why an increase in the relative humidity of a parcel of air generally increases the chance of precipitation?
- (1) The dewpoint is farther from the condensation point, causing rain.  
(2) The air temperature is closer to the dewpoint, making cloud formation more likely.  
(3) The amount of moisture in the air is greater, making the air heavier.  
(4) The specific heat of the moist air is greater than the drier air, releasing energy.
- 7 A student uses a sling psychrometer outdoors on a clear day. The dry-bulb (air) temperature is 10°C. The water on the wet bulb will most likely
- (1) condense, causing the wet-bulb temperature to be higher than the air temperature  
(2) condense, causing the wet-bulb temperature to be equal to the air temperature  
(3) evaporate, causing the wet-bulb temperature to be lower than the air temperature  
(4) evaporate, causing the wet-bulb temperature to be equal to the air temperature
- 8 Most water vapor enters the atmosphere by the processes of
- (1) convection and radiation  
(2) condensation and precipitation  
(3) evaporation and transpiration  
(4) erosion and conduction

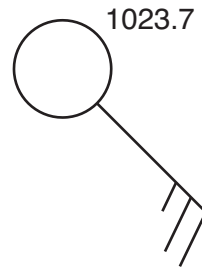
- 9 Which station model shows the correct form for indicating a northwest wind at 25 knots and an air pressure of 1023.7 mb?



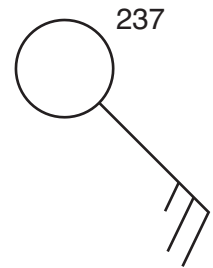
( 1 )



( 2 )

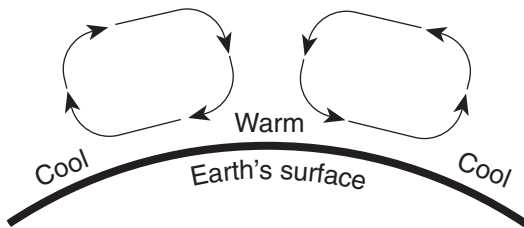


( 3 )

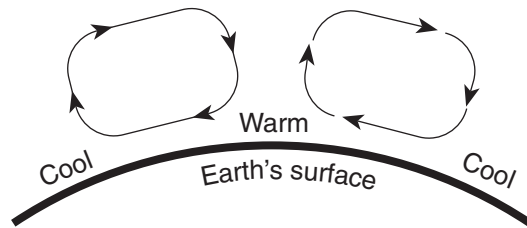


( 4 )

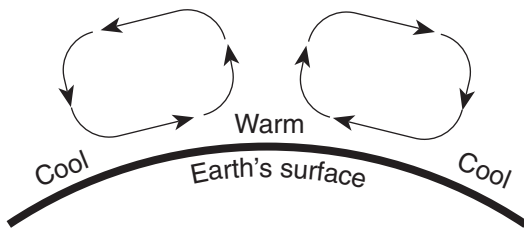
- 10 The cross sections below show different patterns of air movement in Earth's atmosphere. Air temperatures at Earth's surface are indicated in each cross section. Which cross section shows the most likely pattern of air movement in Earth's atmosphere that would result from the surface air temperatures shown?



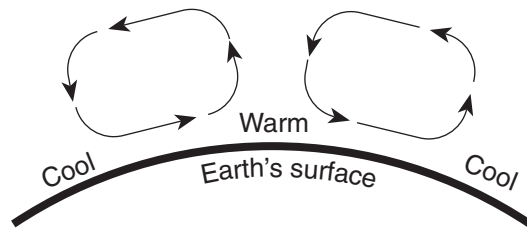
( 1 )



( 3 )

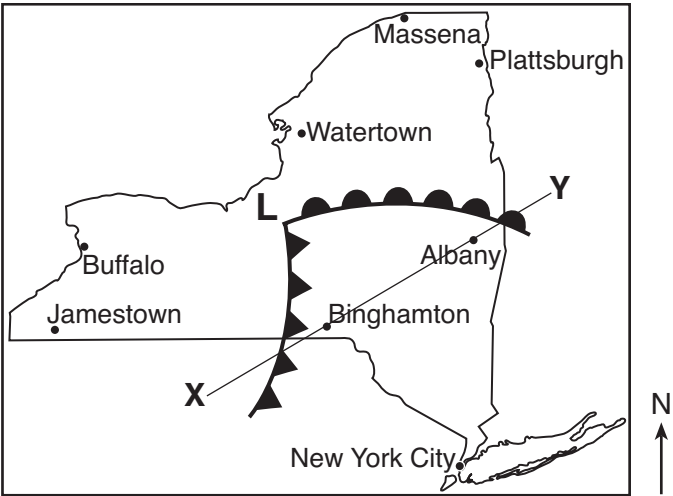


( 2 )

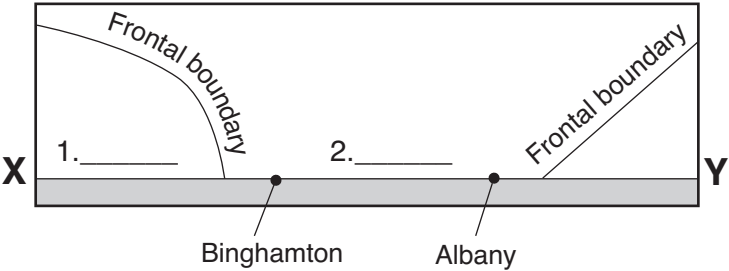


( 4 )

Base your answers to questions 11 through 13 on the weather map below. The weather map shows a low-pressure system in New York State during July. The **L** represents the center of the low-pressure system. Two fronts extend from the center of the low. Line **XY** on the map is a reference line.



11 The cross section **below** shows a side view of the area along line **XY** on the map. On lines 1 and 2 in the cross section, place the appropriate two-letter air-mass symbols to identify the most likely type of air mass at *each* of these locations.



12 The forecast for one city located on the map is given below:

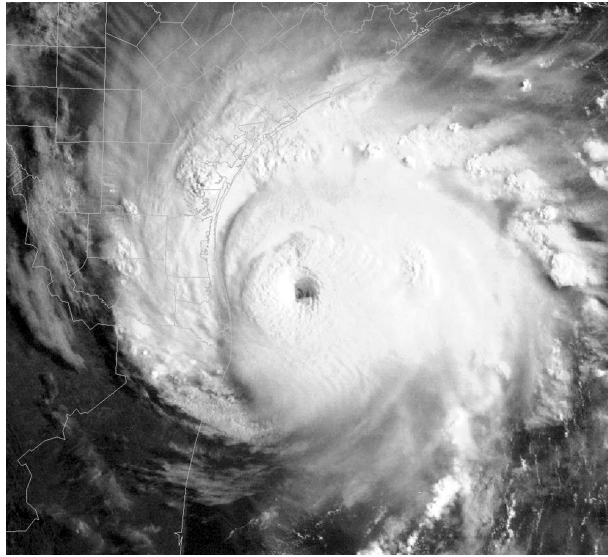
“In the next hour, skies will become cloud covered. Heavy rains are expected with possible lightning and thunder. Temperatures will become much cooler.”

State the name of the city for which this forecast was given. \_\_\_\_\_

13 Identify *one* action that people should take to protect themselves from lightning.

\_\_\_\_\_

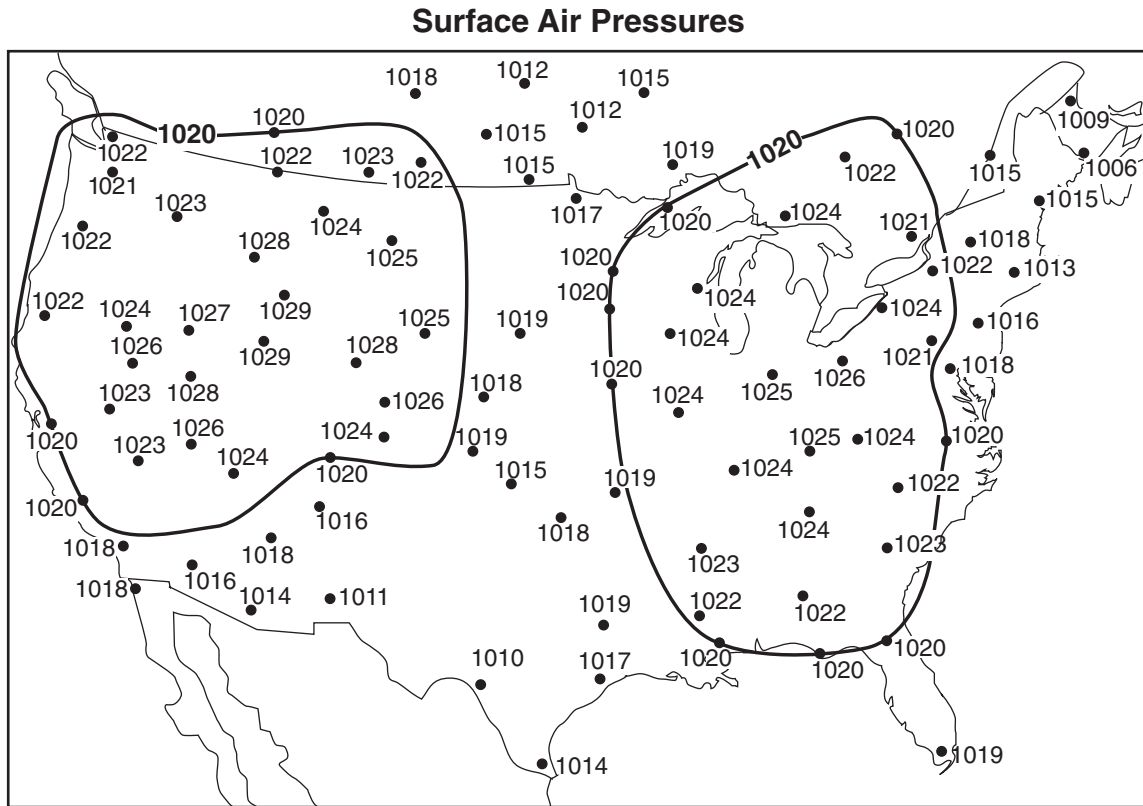
Base your answers to questions 14 through 17 on the satellite image below, which shows a Northern Hemisphere hurricane, and on your knowledge of Earth science.



- 14 What is the usual surface wind pattern around the eye of Northern Hemisphere hurricanes?
- |                                  |   |
|----------------------------------|---|
| (1) clockwise and <b>inward</b>  | (3) counterclockwise and <b>inward</b>  |
| (2) clockwise and <b>outward</b> | (4) counterclockwise and <b>outward</b> |
- 15 Which air mass is normally associated with the formation of hurricanes?
- |                              |                                 |
|------------------------------|---------------------------------|
| (1) continental <b>polar</b> | (3) continental <b>tropical</b> |
| (2) maritime <b>polar</b>    | (4) maritime <b>tropical</b>    |
- 16 Clouds form in the hurricane because the air is
- |                                       |   |
|---------------------------------------|---|
| (1) sinking, expanding, and cooling   | (3) rising, <b>compressing</b> and <b>warming</b> |
| (2) sinking, compressing, and warming | (4) rising, <b>expanding</b> and <b>cooling</b>   |
- 17 When the eye of this hurricane reaches 43° N latitude, this hurricane will most likely be pushed by planetary winds toward the
- |                      |               |
|----------------------|---------------|
| (1) <b>northeast</b> | (3) southwest |
| (2) northwest        | (4) southeast |

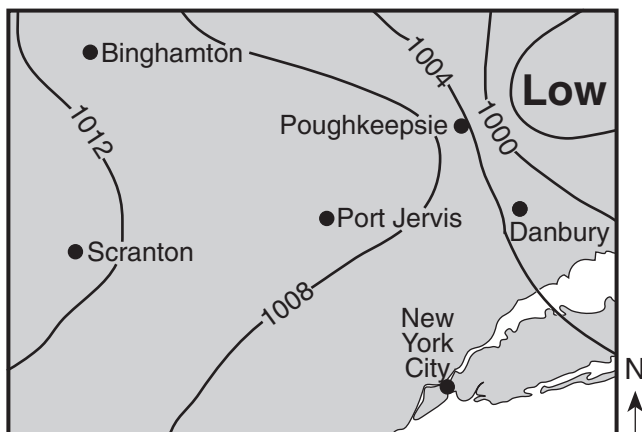
Base your answers to questions 18 and 19 on the weather map provided below, which shows surface air-pressure readings, in millibars, at various locations in the United States and Canada. The 1020-millibar isobars have been drawn and labeled.

18 Draw the 1024- and 1028-millibar isobars on the weather map provided below.



19 What weather instrument was most likely used to measure these air pressures? \_\_\_\_\_

Base your answers to questions 20 and 21 on the weather map below, which shows a low-pressure system centered near Poughkeepsie, New York. Isobars shown are measured in millibars.



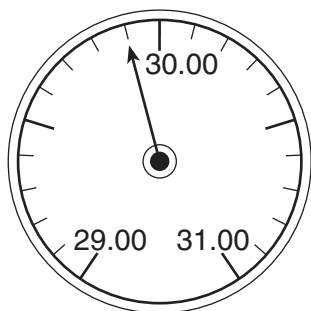
20 Which city is most likely experiencing winds of the greatest velocity?

- |                   |                  |
|-------------------|------------------|
| (1) New York City | (3) Poughkeepsie |
| (2) Binghamton    | (4) Scranton     |

21 Surface winds are most likely blowing from

- (1) Danbury toward New York City
- (2) Poughkeepsie toward Scranton
- (3) Binghamton toward Danbury
- (4) Port Jervis toward Binghamton

- 22 The diagram below represents an aneroid barometer that shows the air pressure, in inches of mercury.



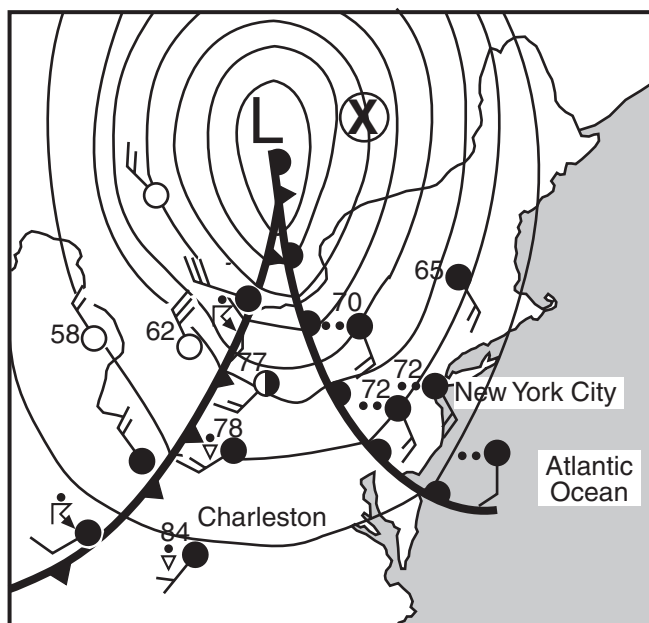
When converted to millibars, this air pressure is equal to

- (1) 1009.0 mb                      (3) 1015.5 mb  
(2) 1012.5 mb                      (4) 1029.9 mb
- 23 If a low-pressure system follows a typical storm track across New York State, it will move toward the
- (1) southeast                      (3) northeast  
(2) southwest                      (4) northwest
- 24 Which geographic area is a common source region for cP air masses that move into New York State?
- (1) southwestern United States  
(2) central Canada  
(3) the north Pacific Ocean  
(4) the Gulf of Mexico

---

Base your answers to questions 25 through 26 on the weather map provided **below**, which shows a weather system over the northeastern United States and weather data for several locations. Isobars show a low-pressure (L) center. Point X is a location in Canada.

- 25 On the weather map provided **below**, draw a curved arrow through point X to show the general direction of surface winds on that side of the low-pressure center.



- 26 State the relationship between isobar spacing on the map and wind velocity.

---

---

27 Which weather change is most likely indicated by rapidly **rising** air pressure?

- (1) Humidity is decreasing.
- (2) Temperature is **increasing**.
- (3) Skies are **becoming cloudy**.
- (4) A storm is approaching.

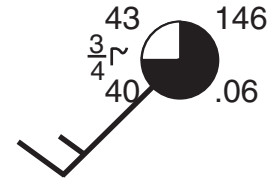
28 A parcel of air has a dry-bulb temperature of 24°C and a relative humidity of 55%. What is the dewpoint of this parcel of air?

- (1) 6°C
- (2) 14°C
- (3) 24°C
- (4) 29°C

29 The properties of an air mass are mostly determined by the

- (1) rate of Earth's rotation
- (2) direction of Earth's surface winds
- (3) source region where the air mass formed
- (4) path the air mass follows along a land surface

30 Various weather conditions at LaGuardia Airport in New York City are shown on the station model below.



What were the barometric pressure and weather conditions at the airport at the time of the observation?

- (1) 914.6 mb of pressure and smog
- (2) 914.6 mb of pressure and a clear sky
- (3) 1014.6 mb of pressure and smog
- (4) 1014.6 mb of pressure and a clear sky

---

Base your answers to questions 31 and 32 on the weather map provided **below**, which shows a large white band of clouds moving toward the southeast. The line shown in the middle of the white cloud band is the frontal boundary between a cP air mass and an mT air mass. Two large arrows show the direction the front is moving.

31 On the frontal boundary line on the weather map provided **below**, draw the weather front symbol to represent the front moving toward the southeast.

32 On the same weather map, place an **X** centered on the geographic region that was most likely the source of the warm, moist (mT) air mass.

