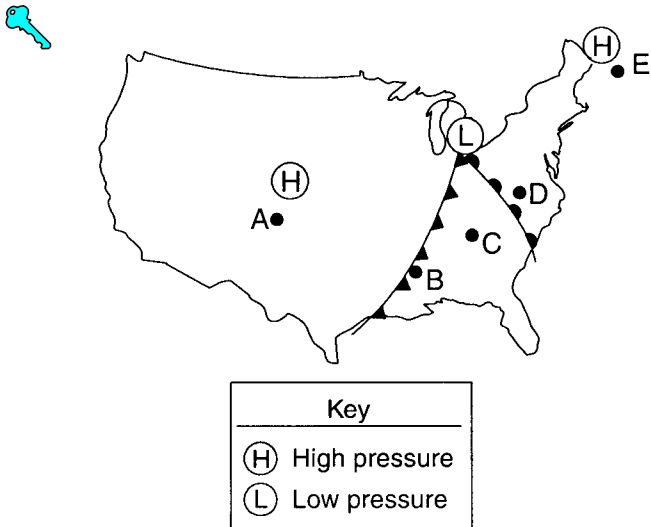


1. The map below shows high-pressure and low-pressure weather systems in the United States.



Which two lettered positions on the map are most likely receiving precipitation?

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

2. Weather-station measurements indicate that the dewpoint temperature and air temperature are getting farther apart and that air pressure is rising. Which type of weather is most likely arriving at the station?

- 1) a snowstorm
- 2) a warm front
- 3) cool, dry air
- 4) maritime tropical air

3. A temperature of 20°C is equal to a temperature of

- 1) -7°F
- 2) 36°F
- 3) 68°F
- 4) 293°F

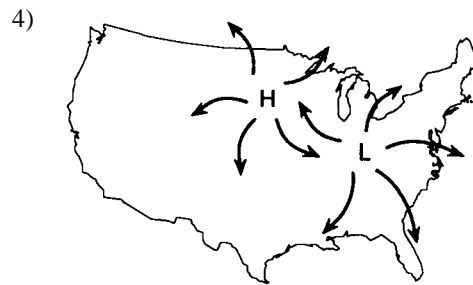
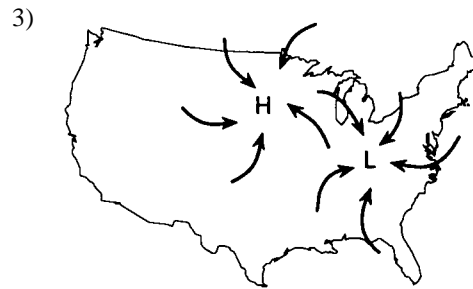
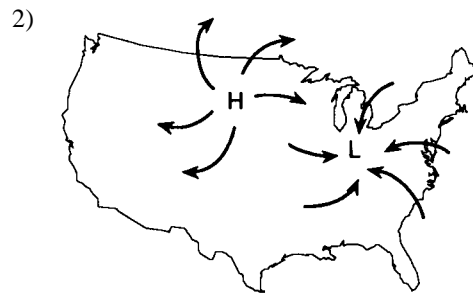
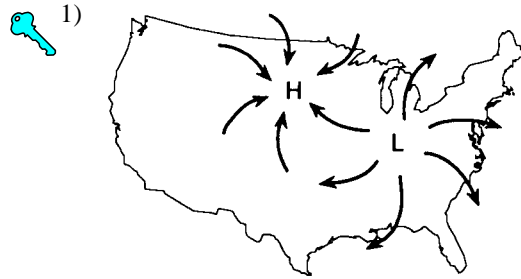
4. Students wish to study the effect of elevation above sea level on air temperature and air pressure. They plan to hike in the Adirondack Mountains from Heart Lake, elevation 2,179 feet, to the peak of Mt. Marcy, elevation 5,344 feet. Which instruments should they use to collect their data?

- 1) anemometer and psychrometer
- 2) anemometer and barometer
- 3) thermometer and psychrometer
- 4) thermometer and barometer

5. In a certain area the air temperature and the dewpoint temperature are approaching the same value. The air pressure is decreasing and the cloud cover is increasing. What atmospheric change is most likely occurring in this area?

- 1) Warm, moist air is moving into the area.
- 2) Warm, dry air is moving into the area.
- 3) Cold, dry air is moving into the area.
- 4) A cold front has just passed through this area.

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



7. What is the primary cause of winds?

- 1) humidity differences
- 2) air pressure differences
- 3) the revolution of Earth
- 4) the rotation of Earth

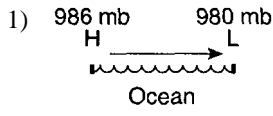
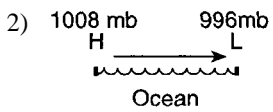
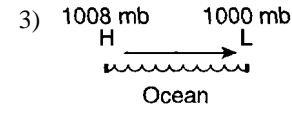
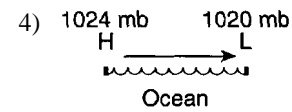
8. On a certain day, the isobars on a weather map are very close together over eastern New York State. To make the people of this area aware of possible risk to life and property in this situation, the National Weather Service should issue

- 1) a dense-fog warning
- 2) a high-wind advisory
- 3) a heat-index warning
- 4) an air-pollution advisory

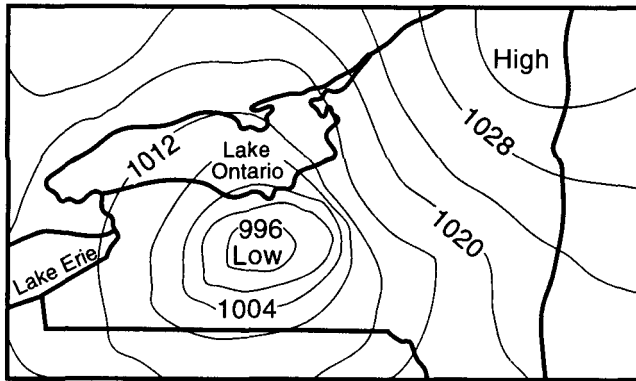
9. Clouds usually form when moist air rises because the air

- 1) contracts and cools
- 2) contracts and warms
- 3) expands and cools
- 4) expands and warms

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

- 1)  2) 
- 3)  4) 

11. Base your answer to the following question on the weather map below. The map shows a low-pressure system that is influencing the weather conditions in New York State.



Wind velocity is probably greatest at which city?

- 1) Buffalo 3) Syracuse
2) Rochester 4) Watertown

12. Why do clouds usually form at the leading edge of a cold air mass?

- 1) Cold air flows over warm air, causing the warm air to descend and cool.
2) Cold air flows under warm air, causing the warm air to rise and cool.
3) Cold air contains more dust than warm air does.
4) Cold air contains more water vapor than warm air does.

13. Which surface features would give an air mass mT characteristics?

- 1) warm, moist surfaces 3) warm, dry surfaces
2) cold, moist surfaces 4) cold, dry surfaces

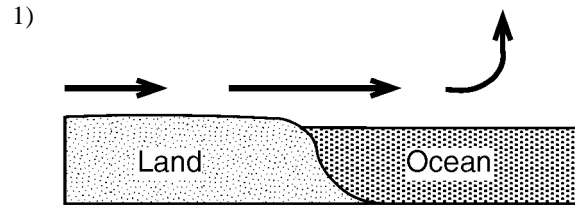
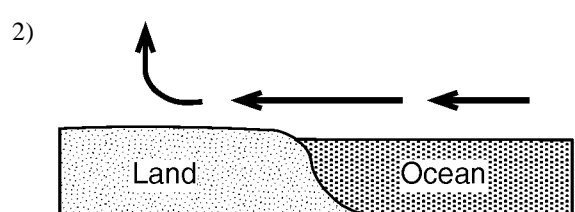
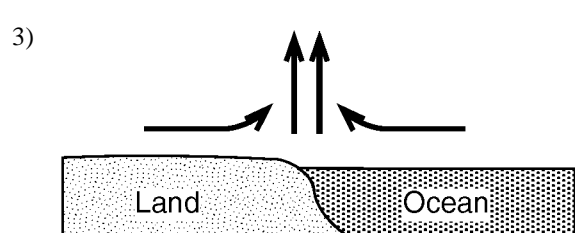
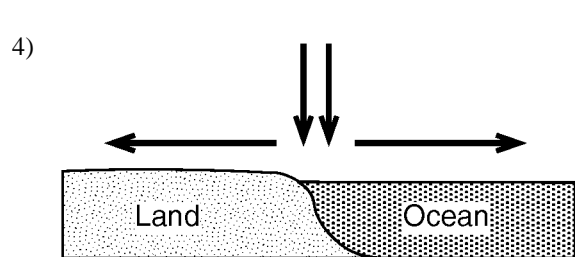
14. The properties of an air mass depend mainly on the

- 1) wind speed within the air mass
2) characteristics of the surface over which the air mass was formed
3) size of the air mass
4) rotation of the Earth

15. An air mass originating over the North Pacific Ocean would most likely be

- 1) continental polar 3) maritime polar
2) continental tropical 4) maritime tropical

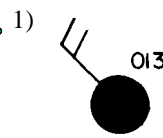
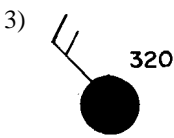
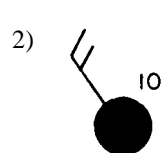
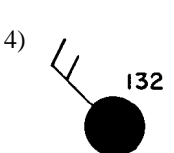
16. Adjacent land and ocean surfaces have the same temperature at sunrise on a clear, calm, summer day. Then the land and water are heated by the Sun for several hours. Which cross section shows the most likely direction of surface winds that will develop at this ocean shore?

- 1) 
- 2) 
- 3) 
- 4) 

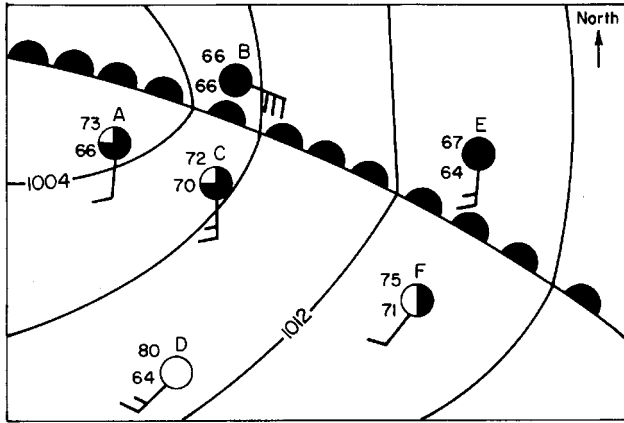
17. Compared to a maritime tropical air mass, a maritime polar air mass has

- 1) lower temperature and less water vapor
2) lower temperature and more water vapor
3) higher temperature and less water vapor
4) higher temperature and more water vapor

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

- 1)  3) 
- 2)  4) 

Base your answers to questions 30 through 33 on your knowledge of Earth science, the *Earth Science Reference Tables*, and the map below which represents a section of a surface weather map. Letters A through F represent weather stations.



30. At which weather station is the wind speed greatest?

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

31. In order to test the rate of evaporation, equal amounts of water are exposed to the open air outside each weather station. At which station will the water probably evaporate at the fastest rate?

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

32. Which weather station has the greatest amount of cloud cover?

- 1) A
- 2) E
- 3) F
- 4) D

33. The warm front is moving toward the

- 1) northeast
- 2) northwest
- 3) southeast
- 4) southwest

34. The rate of evaporation of water can be increased by

- 1) increasing the amount of moisture in the air
- 2) decreasing the temperature of the water
- 3) increasing the temperature of the air
- 4) decreasing the circulation of the air

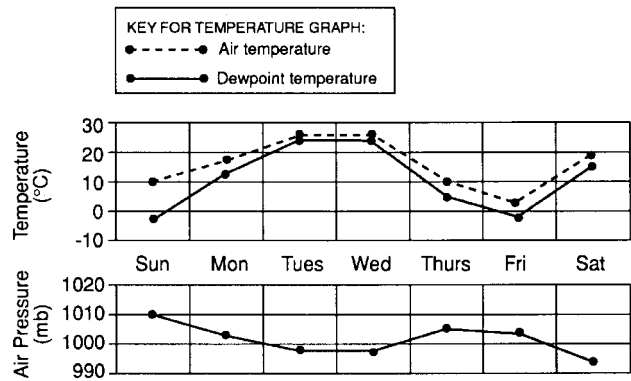
35. The air temperature and the wet-bulb temperature were measured and both were found to be 18°C. Two hours later, measurements were taken again and the air temperature was 20°C, while the wet-bulb temperature remained 18°C. The relative humidity of the air during those two hours

- 1) decreased
- 2) increased
- 3) remained the same

36. What is the approximate dewpoint temperature when the dry-bulb reading is 14°C and the wet-bulb reading is 8°C?

- 1) 1°C
- 2) 6°C
- 3) -6°C
- 4) -9°C

37. Base your answer to the following question on the *Earth Science Reference Tables* and the graphs below. The graphs show the noontime air temperatures, dewpoint temperatures, and air pressures recorded at a location in New York State.



Which partial weather station model best represents the conditions for Sunday at noon?

- 1)
- 2)
- 3)
- 4)

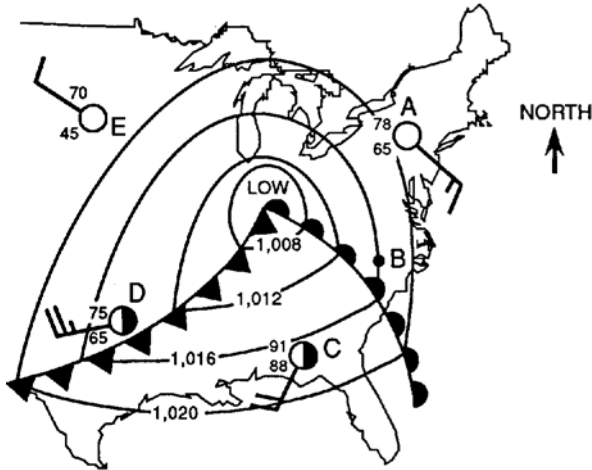
38. Base your answer to the following question on the data table below. The data table shows the air pressures and air temperatures collected by nine observers at different elevations on the same side of a high mountain. The data were collected at 12:00 noon on a clear, calm day.

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

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

- 1)
- 2)
- 3)
- 4)

39. Base your answer to the following question on on the *Earth Science Reference Tables* and the weather map below showing part of the United States. Letters A through E represent weather stations.



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

- 1)
- 2)
- 3)
- 4)

40. What is the dewpoint temperature when the dry-bulb temperature is 22°C and the wet-bulb temperature is 15°C?



- 1) 7°C 3) 12°C
2) 10°C 4) 14°C

41. Which event usually occurs when air is cooled to its dewpoint temperature?



- 1) freezing 3) condensation
2) evaporation 4) transpiration

42. When the dry-bulb reading of a thermometer is 20°C and the wet-bulb reading is 11°C, the relative humidity is approximately



- 1) 17% 3) 33%
2) 30% 4) 55%

43. Condensation will most likely occur in a given volume of air when the air is



- 1) saturated and contains no condensation nuclei
2) saturated and contains condensation nuclei
3) unsaturated and contains no condensation nuclei
4) unsaturated and contains condensation nuclei

44. Which statement best explains how atmospheric dust particles influence the water cycle?



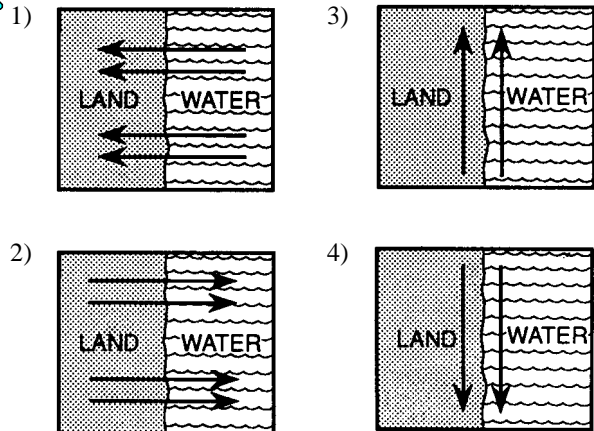
- 1) Dust particles are the main source of dissolved salts in the sea.
2) Dust particles increase the capacity of the atmosphere to hold water vapor.
3) Dust particles increase the amount of evaporation that takes place.
4) Dust particles provide surfaces on which water vapor can condense.

45. The base of a cumulus cloud was determined to be 500 meters above the Earth's surface. This is the altitude at which



- 1) cumulus clouds always form
2) no dust is present in the air
3) the air temperature drops below 0°C
4) the air temperature equals the dewpoint temperature

46. Adjacent water and land masses are of equal temperature at sunrise. They are heated by the morning sun on a clear, calm day. After a few hours, a surface wind develops. Which diagram best represents this wind's direction?



47. 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?



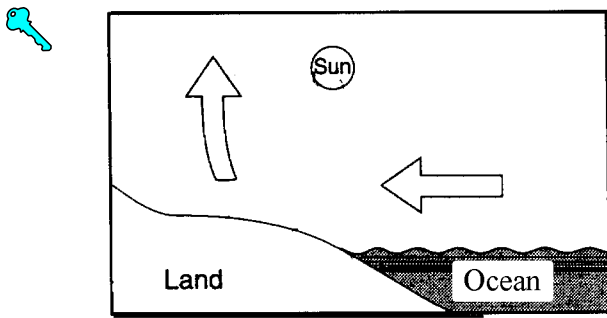
- 1) Winds usually blow from hot to cold areas.
2) Winds never blow from the shore toward the ocean.
3) Air pressure over the ocean is higher than air pressure over the land.
4) Air pressure over the land is higher than air pressure over the ocean.

48. The amount of insolation reflected from the Earth's surface at a particular time is most dependent on the



- 1) angle of the Sun's rays
2) temperature of the Earth's surface
3) amount of nitrogen in the atmosphere
4) distance from the Earth to the Sun

49. In the diagram below, arrows represent air movement near an ocean coastline on a summer afternoon.



Compared to the air over the ocean, the air over the land has a

- 1) lower temperature and lower barometric pressure
- 2) lower temperature and higher barometric pressure
- 3) higher temperature and lower barometric pressure
- 4) higher temperature and higher barometric pressure

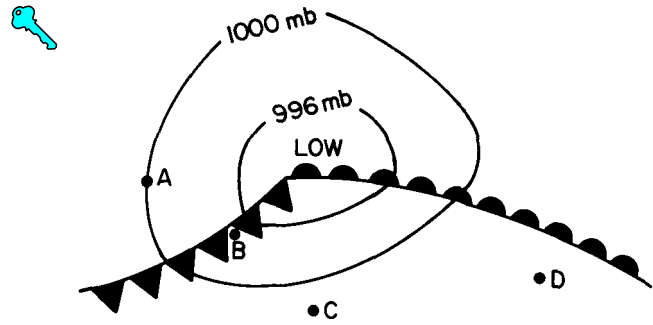
50. In which diagram does the incoming solar radiation reaching the Earth's surface have the greatest intensity?

- 1)
- 2)
- 3)
- 4)

51. At which location will a low-pressure storm center most likely form?

- 1) along a frontal surface between different airmasses
- 2) near the middle of a cold airmass
- 3) on the leeward side of mountains
- 4) over a very dry, large, flat land area

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



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

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

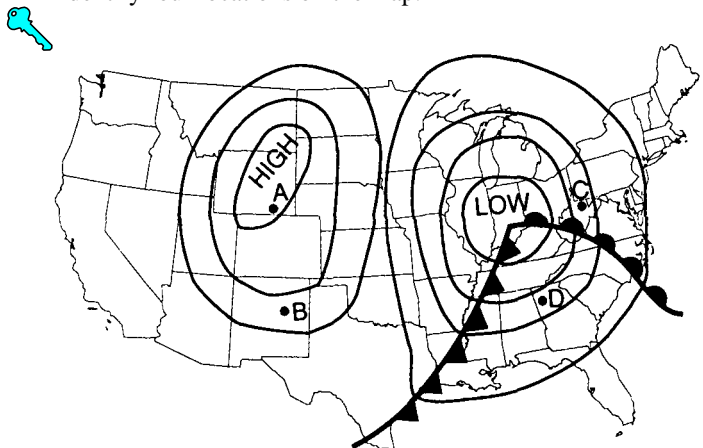
53. An observer reports the following data for a location in New York State:

Air temperature = 35°C
 Pressure = 996 mb
 Relative humidity = 84 %

The weather conditions at this location would best be described as

- 1) hot and dry
- 2) hot and humid
- 3) cool and dry
- 4) cool and humid

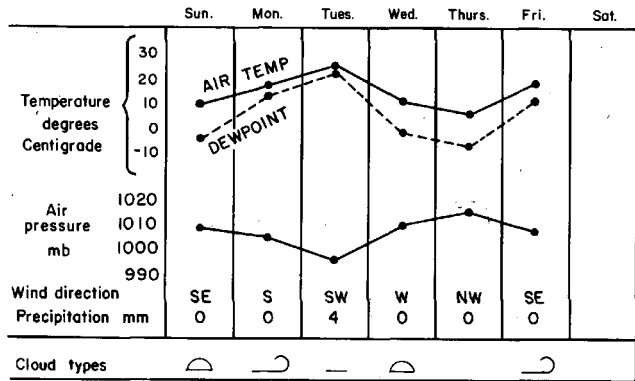
54. The weather map below shows two air pressure systems covering a large geographic area. Points A through D identify four locations on the map.



At which location is precipitation most likely occurring?

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

55. Base your answer to the following question on the *Earth Science Reference Tables* and the chart below which contains a summary of weather observations taken at noon during a six-day period.



Cloud cumulus
 stratus
 cirrus

Which weather symbol would most likely have been used to represent this region on Thursday?

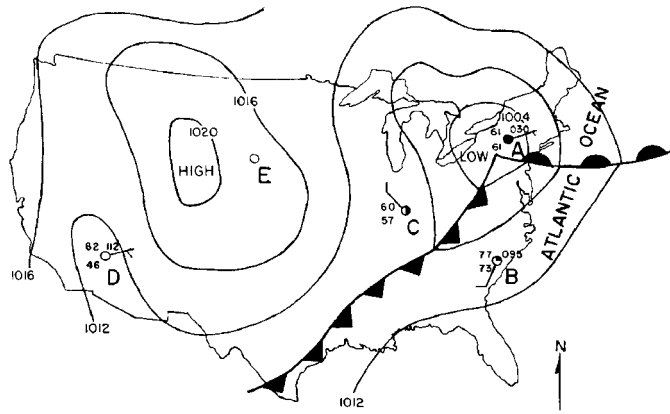
- 1)
- 2)
- 3)
- 4)

56. Which station model represents an atmospheric pressure of 1,009.2 millibars and a temperature of 75°F?



- 1)
- 2)
- 3)
- 4)

Base your answers to questions 57 through 60 on your knowledge of Earth science, the *Earth Science Reference Tables*, and the surface weather map shown below. The map shows weather systems over the United States and weather station data for cities A, B, C, and D. Note that part of the weather data for city C and all of the weather data for city E are missing. The pressure field (isobars) on the map has been labeled in millibars.



57. Which city is probably experiencing a slow, steady rain?

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

58. What type of front extends eastward away from the low-pressure center?

- 1) cold
- 2) warm
- 3) stationary
- 4) occluded

59. Which weather station model best represents the weather conditions probably existing at city E?

- 1) 1) 2) 3) 4)

60. If this low-pressure center has followed a normal storm track, which map shows its most likely path over the last two days?

- 1)
- 2)
- 3)
- 4)
