

MIDTERM PART II REVIEW #3

Base your answers to **questions 1 through 4** on the reading passage below and on your knowledge of Earth science.

Greenhouse Effect

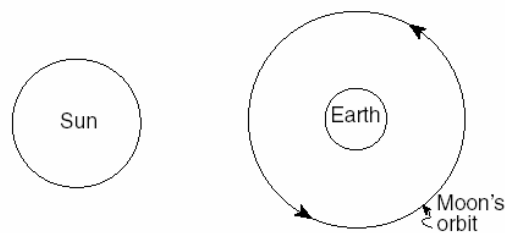
The warming of Earth's surface and lower atmosphere tends to intensify with an increase in atmospheric carbon dioxide. The atmosphere allows a large percentage of the visible light rays from the Sun to reach Earth's surface. Some of this energy is reradiated by Earth's surface in the form of long-wave infrared radiation. Much of this infrared radiation warms the atmosphere when it is absorbed by molecules of carbon dioxide and water vapor. A similar warming effect is produced by the glass of a greenhouse, which allows sunlight in the visible range to enter, but prevents infrared radiation from leaving the greenhouse.

The absorption of infrared radiation causes Earth's surface and the lowest layer of Earth's atmosphere to warm to a higher temperature than would otherwise be the case. Without this "greenhouse" warming, Earth's average surface temperature could be as low as -73°C . The oceans would freeze under such conditions.


Many scientists believe that modern industrialization and the burning of fossil fuels (coal, oil, and natural gas) have increased the amount of atmospheric carbon dioxide. This increase may result in an intensified greenhouse effect on Earth causing significant alterations in climate patterns in the future. Scientists estimate that average global temperatures could increase by as much as 5°C by the middle of the 21st century.

1. The lowest layer of Earth's atmosphere has undergone a large increase in temperature due to the presence of greenhouse gases. State the name of this temperature zone layer.
2. In addition to the ones listed, name another greenhouse gas.
3. Explain why most scientists believe an increase in the greenhouse effect will cause sea levels to rise.
4. State one possible change humans could make to significantly reduce the amount of greenhouse gases added to the atmosphere each year.

Base your answers to **questions 5 through 7** on the diagram provided below and on your knowledge of Earth science. The diagram shows the Sun, Earth, and the Moon's orbit around Earth as viewed from space.

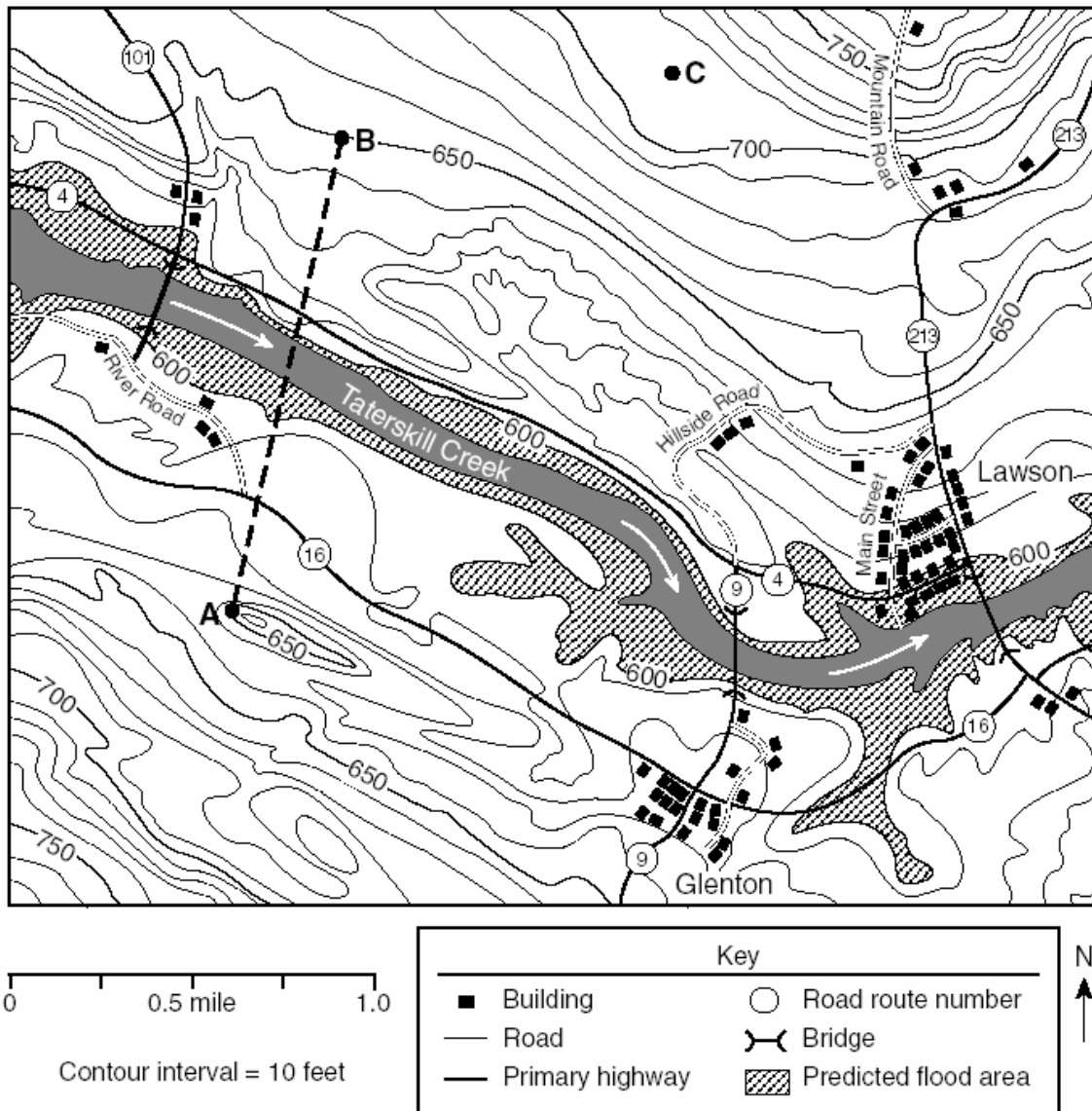


(Not drawn to scale)

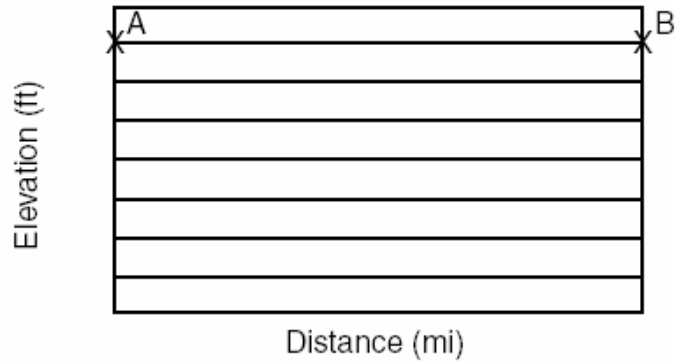
5. On the diagram provided, draw a circle of approximately this size  to represent the Moon's position in its orbit when a solar eclipse is viewed from Earth.
6. Approximately how many complete revolutions does the Moon make around Earth each month?
7. Explain why solar eclipses do not occur every time the Moon revolves around Earth.

Base your answers to **questions 8 through 10** on the topographic map below. The map shows a portion of the Taterskill Creek flowing past the towns of Lawson and Glenton. The shaded area is Taterskill Creek. The arrows in the creek show its direction of flow. Points *A*, *B*, and *C* are locations on the map. Points *A* and *B* are connected with a reference line.

Mercado Dam is located 32 miles upstream from Lawson. In the remote possibility of a failure of the Mercado Dam, the Taterskill Creek is expected to rise to the 600-foot contour line in the vicinity of the two towns.



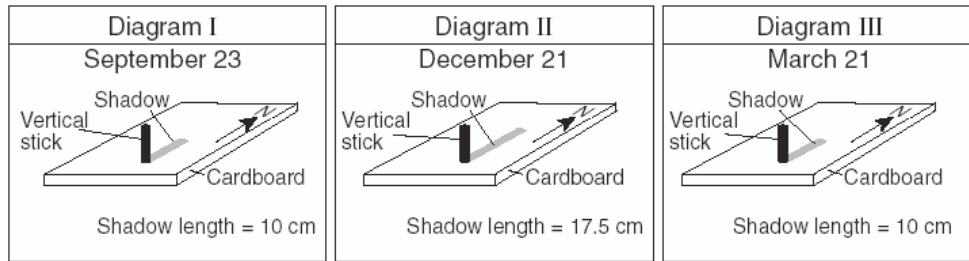
8. On the grid provided, construct a topographic profile from point *A* to point *B*, following the directions:
 - a* Write numbers along the vertical axis to show an appropriate scale for the elevations crossed by line *AB*. Your number scale should label at least half of the lines along the vertical axis and should not extend beyond the grid provided.
 - b* Plot the elevation along line *AB* by marking an *X* at *each* point where a contour line is crossed. Point *A* and point *B* have been plotted for you.
 - c* Connect all the *X*s to complete a profile that accurately reflects the elevation of the land.



9. State a possible elevation for point *C* on the map. _____

10. If Mercado Dam ruptured, the first floodwater would take exactly 4 hours to reach the town of Lawson. In the space provided, calculate the average rate of travel for the leading edge of the floodwater. Label your answer with the correct units.

Base your answers to questions 11 and 12 on diagrams I through III below. Diagrams I, II, and III represent the length and direction of the shadow of a vertical stick measured at noon on three different dates at 42° N latitude.



11. Explain how the changing altitude of the noon Sun affects the length of the shadows shown in the diagrams.

12. On the diagram provided, draw the direction and length of the shadow at noon that will most likely be observed at 42° N latitude on June 21.

