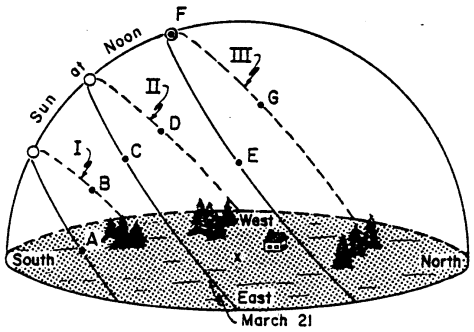
ROMANO

Earth Motions Practice Worksheet #1

Base your answers to questions 1-5 on your knowledge of Earth Science and the diagram below. The diagram represents the apparent path of the Sun at three different dates during the year as it appears to an observer in New York State. The paths are labeled I, II, III and letters A through G are points on the paths. Path II occurs on March 21.



1. Which statement explains the apparent daily motion of the Sun across the sky along path II?
   (1) The Earth rotates on its axis.
   (2) The Earth revolves around the Sun.
   (3) The Earth's axis is inclined to its orbit.
   (4) The Earth's orbit is elliptical.

2. The angular distance along path II between points C and D is measured to be 90°. Approximately how much time would be required for the Sun to move this distance?
   (1) 1 hour
   (2) 2 hours
   (3) 6 hours
   (4) 4 hours

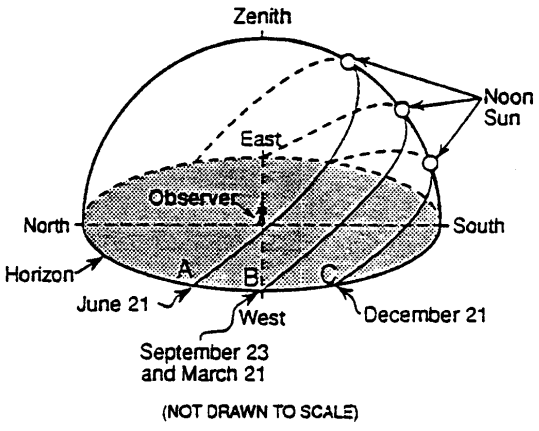
3. What is the azimuth of sunrise on March 21?
   (1) south
   (2) southeast
   (3) northeast
   (4) due east

4. Which would be the approximate length of the daylight period for the observer when the Sun travels along the entire length of path II?
   (1) 9 hours
   (2) 12 hours
   (3) 15 hours
   (4) 18 hours

5. The Sun is at point F, which is the maximum altitude of the Sun for the year. A vertical stick is placed at location X, and the stick's shadow is measured each noon for the next 30 days. During this time, the length of the shadow will
   (1) become shorter
   (2) become longer
   (3) remain the same

Base your answers to questions 6 and 7 on the diagram below which represents the apparent daily path of the Sun across the sky in the Northern Hemisphere on the dates indicated.

6. At noon on which date would the observer cast the longest shadow?
   (1) June 21
   (2) March 21
   (3) September 23
   (4) December 21



7. What is the approximate altitude of the Sun at noon on September 23rd?
   1 20°
   2 48°
   3 75°
   4 90°

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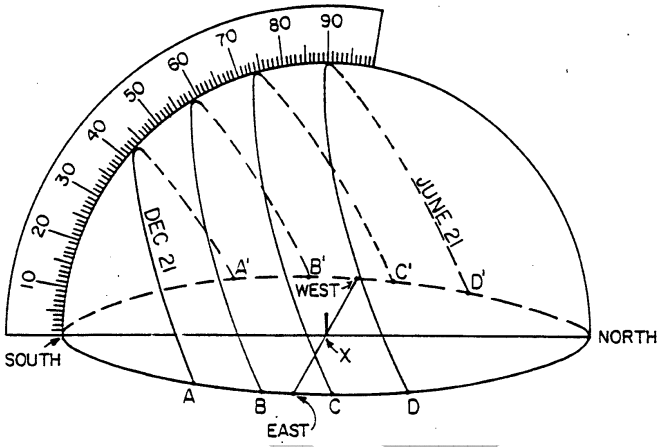
Base your answers to the following questions 8-11 on the diagram below. The diagram represents a plastic hemisphere upon which lines have been drawn to show the apparent paths of the Sun on four days at one location in the Northern Hemisphere. Two of the paths are dated. The protractor is placed over the north-south line. X represents the position of a vertical post.



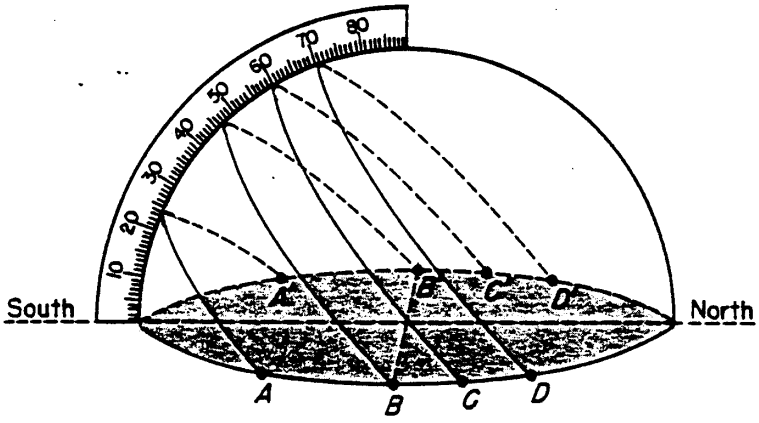
8. For which path is the altitude of the noon Sun 74°?
   (1) A-A' (3) C-C'
   (2) B-B' (4) D-D'

9. How many degrees does the altitude of the Sun change from December 21 to June 21?
   (1) 43° (3) 66 ½°
   (2) 47° (4) 74°

10. Which path of the Sun would result in the longest shadow of the vertical post at solar noon?
   (1) A-A' (3) C-C'
   (2) B-B' (4) D-D'

11. Which statement best explains the apparent daily motion of the Sun?
   (1) The Earth's orbit is an ellipse.
   (2) The Earth's shape is an oblate spheroid.
   (3) The Earth is closest to the Sun in winter.
   (4) The Earth rotates on its axis.

Base your answers to questions 12-15 on the diagram below. The diagram represents a plastic hemisphere upon which lines have been drawn to show the apparent paths of the Sun on four days at a location in New York State. Two of the days are December 21 and June 21. The protractor is placed over the north-south line.



12. What is the solar noon altitude of the Sun for path C-C'?
   (1) 23 ½ ° (3) 60°
   (2) 30° (4) 70 ½ °

13. About how many degrees does the altitude of the Sun change from December 21 to June 21?
   (1) 25° (3) 60°
   (2) 47° (4) 72°

14. What direction would an observer look to see the Sun set on path D-D'
   (1) NW (3) NE
   (2) SW (4) W

15. As the Sun appears to move along path B-B', what time of day would an observer at this location have the shortest shadow?
   (1) 9 a.m. (3) 5 p.m.
   (2) 12 a.m. (4) 12 p.m.