Regents Earth Science Review Name_____

Astronomy

Know the evidence for the earth's rotation.

1_____ 2_____ 3_____

Know the evidence for the earth's revolution.

4_____

Determine the location of the sun's vertical ray on the first day of each season.

5_____ 6_____

Recognize the cause of the seasons.

7_____ 8_____

Predict how the alignment of the earth, sun, and moon results in the moon's phases (and tides/eclipses).

9_____ 10_____

Calculate eccentricity of an ellipse.

11_____ 12_____

Understand the observations caused by a planet's elliptical orbit (Kepler's 1st Law).

13_____

Understand how a planet's changing velocity is related to its distance from the sun (Kepler's 2nd Law).

14_____

Recognize how planetary models have changed over time.

15_____ 16_____

Ability to locate Polaris.

17_____

Plot stars on an H-R Diagram.

18_____ 19_____

Recognize earth's location in the Solar System, Milky Way Galaxy, and Universe.

20_____ 21_____

Have an appreciation for the universe's size, age, and number of objects.

22_____ 23_____

Understand the concept of Red Shift.

24_____ 25_____

Find information about objects in the Solar System in the ESRT.

26_____ 27_____

Compare the inner (terrestrial) planets with the outer (Jovian) planets.

28_____ 29_____

Astronomy

____1. How would a three-hour time exposure photograph of stars in the northern sky appear if the Earth did *not* rotate?

(1) 

(3) 

(2) 

(4) 

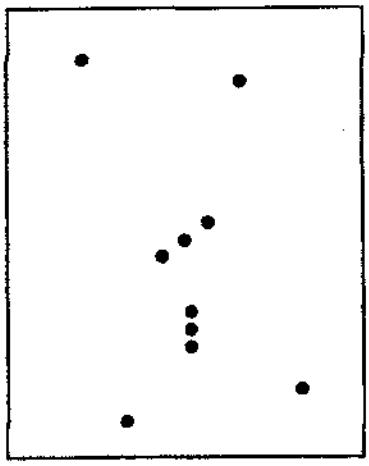
____2. Why do stars appear to move through the night sky at the rate of 15 degrees per hour?

(1) The Earth actually moves around the Sun at a rate of 15° per hour.
(2) The stars actually move around the center of the galaxy at a rate of 15° per hour.
(3) The Earth actually rotates at a rate of 15° per hour.
(4) The stars actually revolve around the Earth at a rate of 15° per hour.

____3. Planet *X* is similar in all respects to the Earth except that it does *not* rotate on its axis. A Foucault pendulum is allowed to swing freely on planet *X*. After 6 hours of swinging, the path of the pendulum's swing, as seen by an observer on planet *X*, will be

(1) the same as the original path
(2) 90° to the right of the original path
(3) 90° to the left of the original path
(4) 180° to the right of the original path

____4. The diagram below represents the major stars of the constellation Orion, as viewed by an observer in New York State.



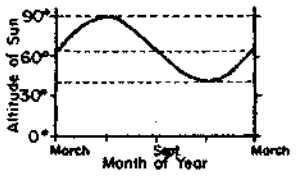
Which statement best explains why Orion can be observed from New York State on December 21 but not on June 21?

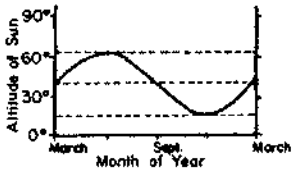
(1) Orion has an eccentric orbit around Earth.
(2) Orion has an eccentric orbit around the Sun.
(3) Earth revolves around the Sun.
(4) Earth rotates on its axis.

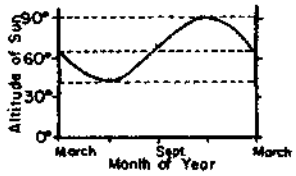
____5. On December 21, at which latitude would an observer find the Sun directly overhead?

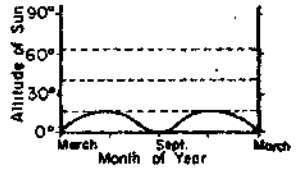
(1) 0° (3) 23 ½° South
(2) 23 ½° North (4) 90° South

____6. For an observer at 23½° N. latitude, which graph best represents the relationship between the altitude of the Sun above the horizon at solar noon and the month of the year?

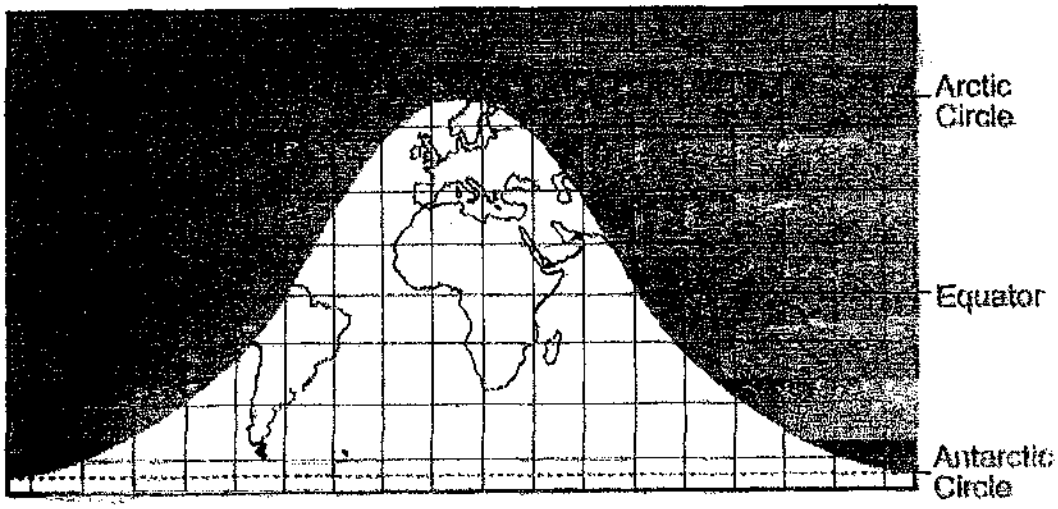
(1) 

(2) 

(3) 

(4) 

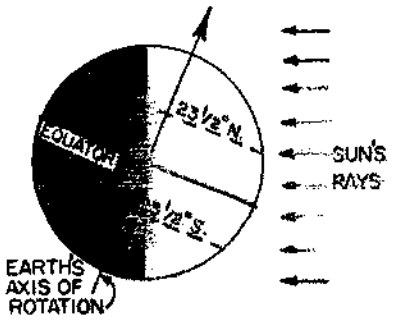
___7. The shaded portion of the map below indicates areas of night and the unshaded portion indicates areas of daylight.



What day of the year is best represented by the map?

(1) March 21 (2) June 21 (3) September 21 (4) December 21

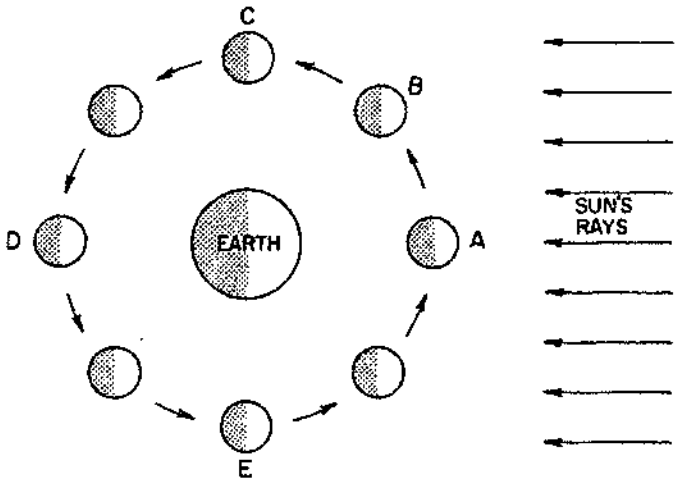
____8. In the diagram below, the direct rays of the Sun are striking the Earth's surface at 23 ½°N. What is the date shown in the diagram?



(1) March 21 (3) September 23

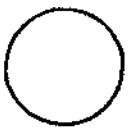
(2) June 21 (4) December 21

____9. Base your answer on the *Earth Science Reference Tables* and the diagram below. The diagram represents the Moon in various positions in its orbit around the Earth. Letters *A* through *E* represent five of the Moon's positions.



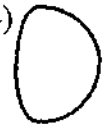
(NOT DRAWN TO SCALE)

Which diagram best represents the appearance of the Moon to an observer on the Earth when the Moon is at position *B*?

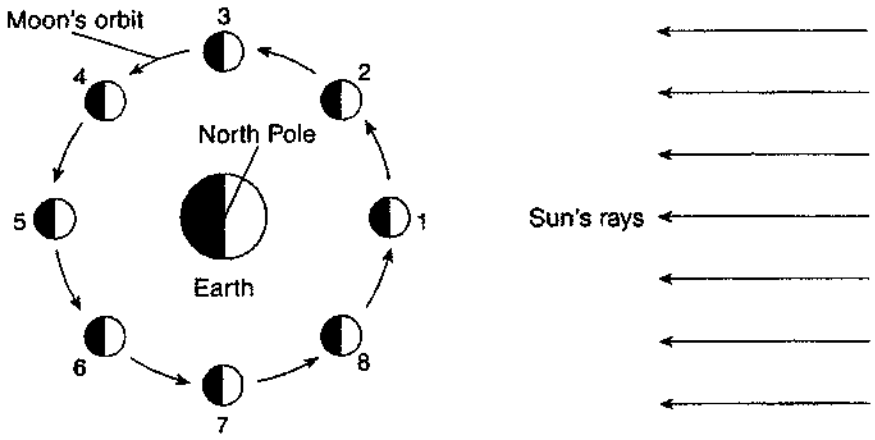
(1) 

(3) 

(2) 

(4) 

___10. Base your answer on the diagram below, which represents the Moon orbiting Earth as viewed from space above the North Pole. The Moon is shown at eight different positions in its orbit.



(Not drawn to scale)

Key
Lighted, visible part of the Moon
Dark, invisible part of the Moon

When the Moon is in position 2, which phase would be visible to an observer in New York State?

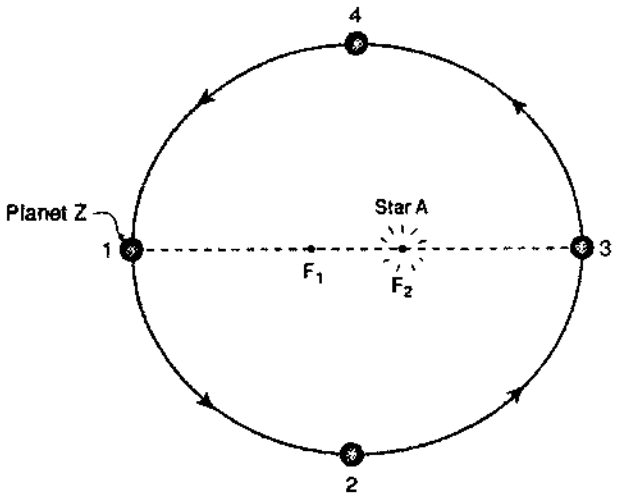
(1) 

(2) 

(3) 

(4) 

____11. Base your answer on the *Earth Science Reference Tables* and the diagram below. The diagram represents planet *Z* in its orbit around star *A*. Locations 1 through 4 of planet *Z* are indicated on the orbit. The sizes of the planet and the star are not drawn to scale. The elliptical orbit of planet *Z* and the distance between the foci (F_1 and F_2) are drawn to scale.

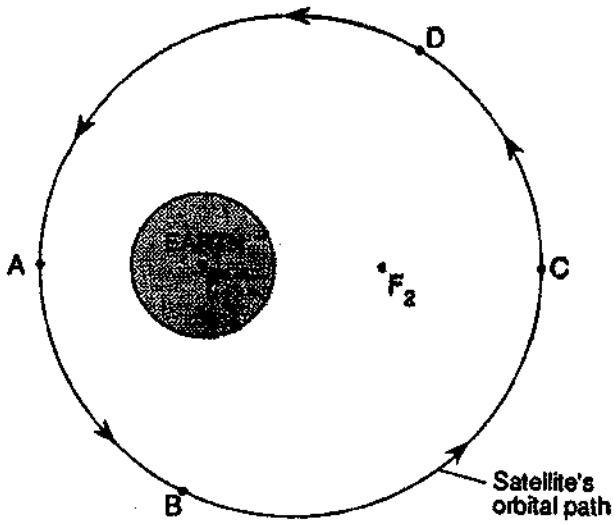


What is the eccentricity of the elliptical orbit of planet *Z*?

(1) 1.0 (3) 0.20

(2) 0.75 (4) 0.10

Base your answers to questions 12 and 13 on the *Earth Science Reference Tables* and the diagram below. The diagram represents the elliptical orbit of a weather satellite around the Earth. Letters *A* through *D* represent locations on the satellite's orbit. F_1 and F_2 are the foci of the satellite's orbit.



(DRAWN TO SCALE)

____12. What is the approximate eccentricity of the satellite's orbit?

(1) 0.10 (3) 0.36

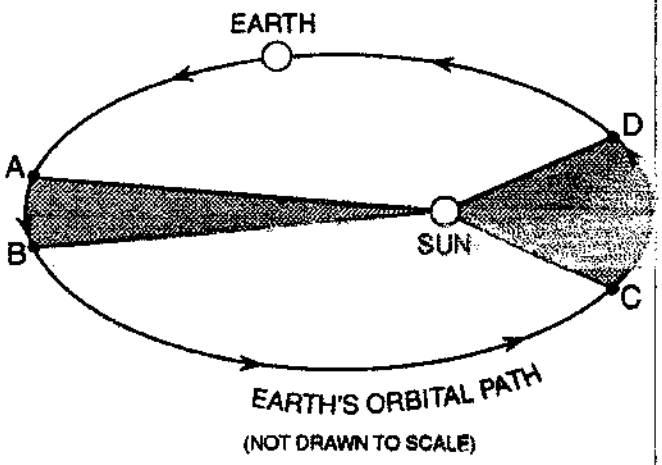
(2) 0.25 (4) 2.8

____13. The satellite's orbital speed will be greatest at location

(1) *A* (3) *C*

(2) *B* (4) *D*

____14. The diagram below represents the Earth's orbital path around the Sun. The Earth takes the same amount of time to move from *A* to *B* as from *C* to *D*.



Which values are equal within the system?

(1) The shaded sections of the diagram are equal in area.
(2) The distance from the Sun to the Earth is the same at point *A* and at point *D*.
(3) The orbital velocity of the Earth at point *A* equals its orbital velocity at point *C*.
(4) The gravitational force between the Earth and the Sun at point *B* is the same as the gravitational force at point *D*.

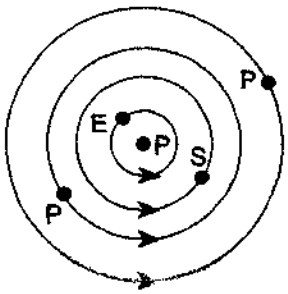
____15. Which planetary model allows a scientist to predict the exact positions of the planets in the night sky over many years?

(1) The planets' orbits are circles in a geocentric model.
(2) The planets' orbits are ellipses in a geocentric model.
(3) The planets' orbits are circles in a heliocentric model.
(4) The planets' orbits are ellipses in a heliocentric model.

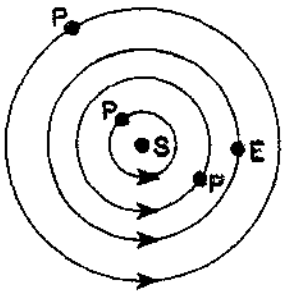
____16. Which diagram represents a geocentric model?

[Key: E = Earth, P = Planet, S = Sun]

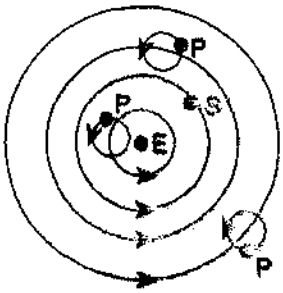
(1)



(2)



(3)



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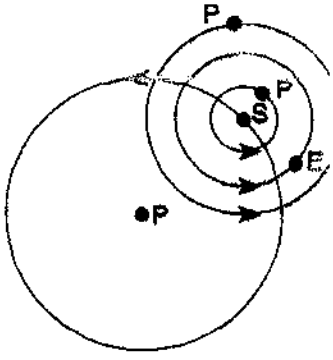
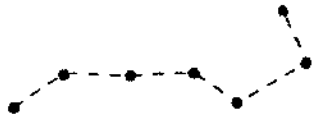


17.



The group of stars known as the Big Dipper can be used to locate the North Star (Polaris) in the night sky. On the diagram of the Big Dipper provided draw a straight arrow passing through *two* stars to indicate the direction to Polaris.

____18. Base your answer to the following question on the *Earth Science Reference Tables.*

Compared to the sun, Polaris is

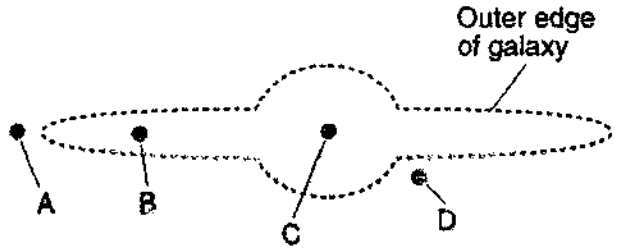
(1) hotter and less luminous
(2) cooler and more luminous
(3) the same temperature and larger
(4) hotter and larger

____19. Base your answer to the following question on the *Earth Science Reference Tables.*

What could be the luminosity of a star that has a temperature of 6,000°C?

(1) 1 (3) 100
(2) .01 (4) 10,000

____20. The diagram below represents a side view of the Milky Way Galaxy.

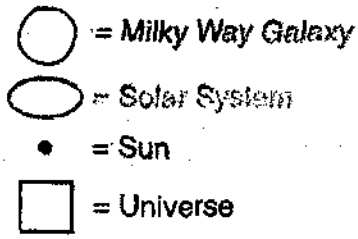


(Not drawn to scale)

At approximately which position is Earth's solar system located?

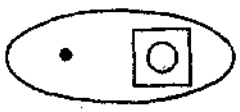
(1) *A* (3) *C*
(2) *B* (4) *D*

____21. The symbols below represent the Milky Way galaxy, the solar system, the Sun, and the universe.



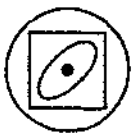
Which arrangement of symbols is most accurate?

(1)



(3)

(2)



(4)