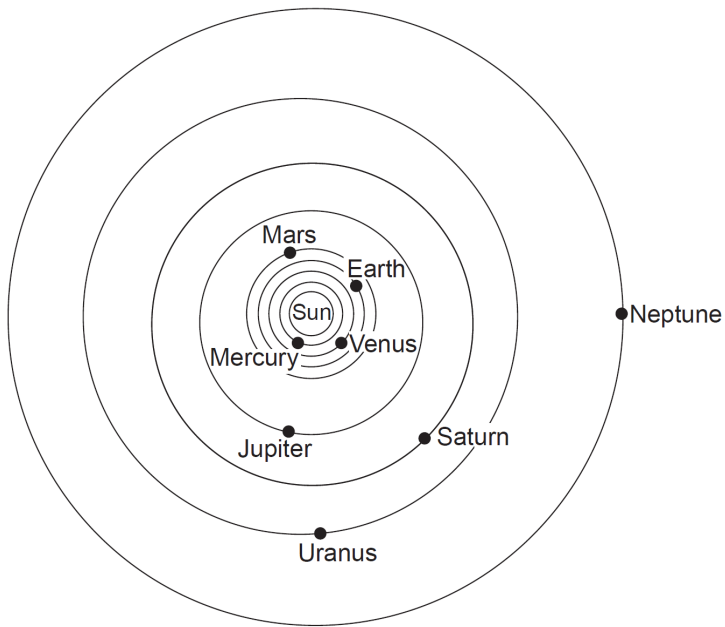


Kepler and the Moon Review

1. Base your answer to the following question on the diagram below and on your knowledge of Earth science. The diagram represents a model of a portion of our solar system.



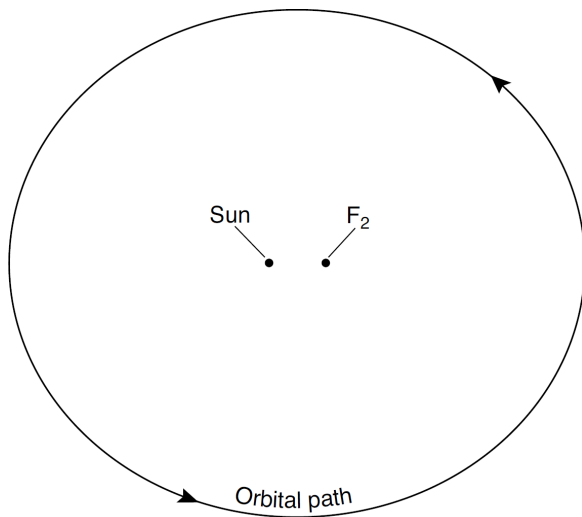
(Not drawn to scale)

In our solar system, the orbits of the planets are best described as

- | | |
|---|---------------------------------------|
| 1) elliptical with the Sun at one focus | 3) circular with the Sun at one focus |
| 2) elliptical with Earth at one focus | 4) circular with Earth at one focus |

Kepler and the Moon Review

2. Base your answer to the following question on your knowledge of Earth science. The diagram represents the elliptical orbit for one planet in our solar system. The two foci of the orbit are shown as the Sun and F_2 .



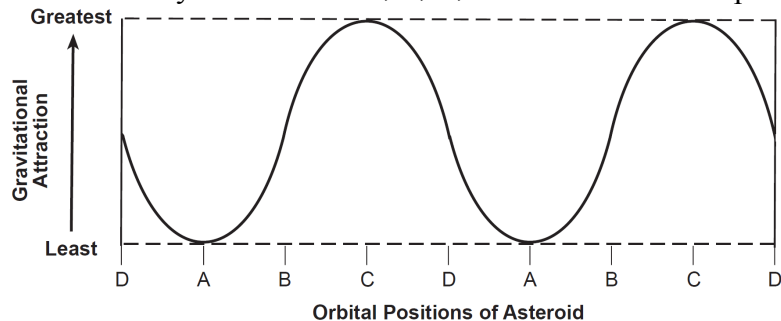
(Not drawn to scale)

Which condition would produce an orbit with a greater eccentricity?

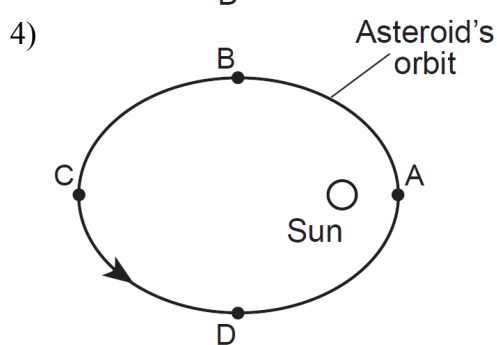
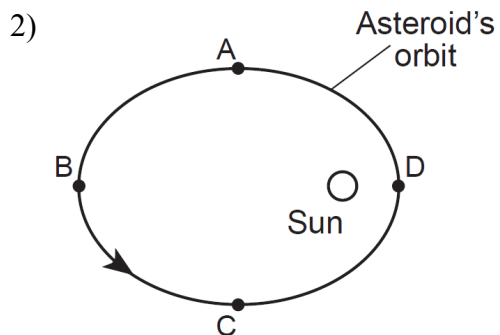
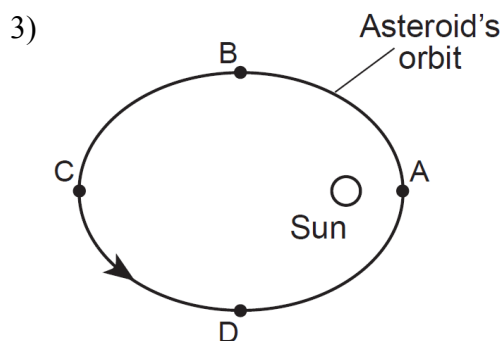
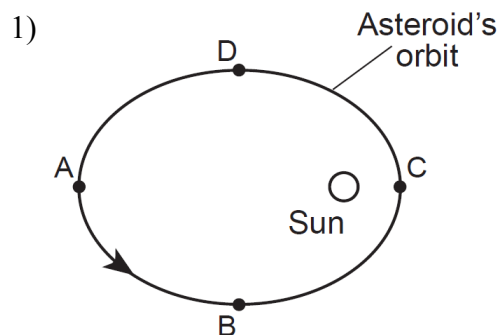
- 1) a decrease in the distance between the Sun and F_2
 - 2) an increase in the distance between the Sun and F_2
 - 3) a constant decrease in the orbital velocity of the planet
 - 4) a constant increase in the orbital velocity of the planet
-
3. Which characteristic is directly related to a planet's average distance from the Sun?
- 1) period of revolution
 - 2) period of rotation
 - 3) eccentricity of orbit
 - 4) equatorial diameter
-

Kepler and the Moon Review

4. The graph below shows the varying amount of gravitational attraction between the Sun and an asteroid in our solar system. Letters *A*, *B*, *C*, and *D* indicate four positions in the asteroid's orbit.

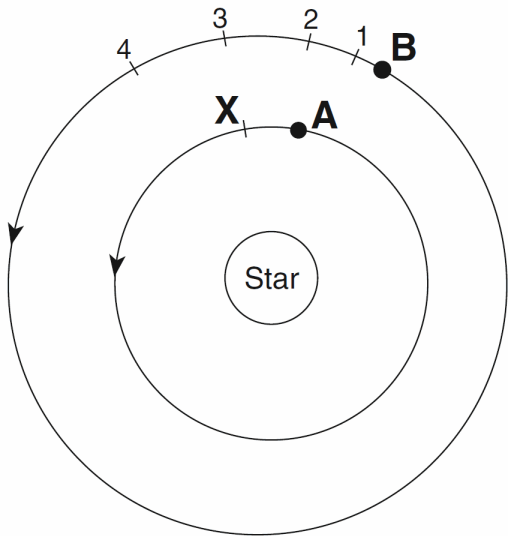


Which diagram best represents the positions of the asteroid in its orbit around the Sun? [Note: The diagrams are not drawn to scale.]



Kepler and the Moon Review

5. Base your answer to the following question on the diagram below, which represents the current locations of two planets, *A* and *B*, orbiting a star. Letter *X* indicates a position in the orbit of planet *A*. Numbers 1 through 4 indicate positions in the orbit of planet *B*.



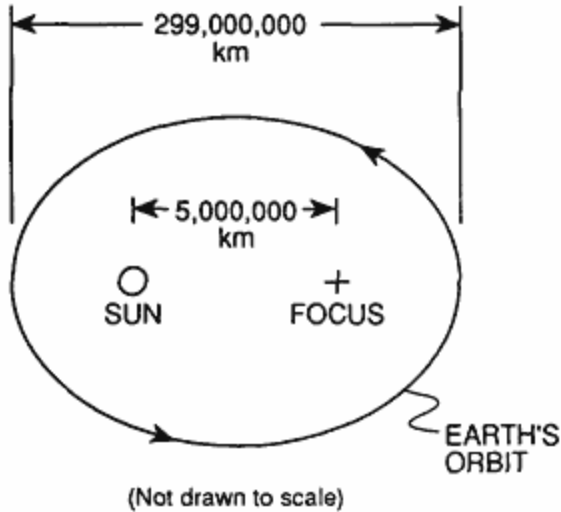
(Not drawn to scale)

As planet *A* moves in orbit from its current location to position *X*, planet *B* most likely moves in orbit from its current location to position

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

Kepler and the Moon Review

6. The diagram below represents the elliptical orbit of the Earth around the Sun.

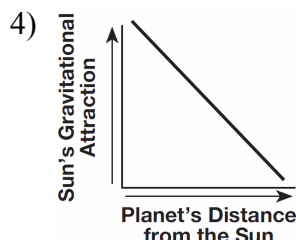
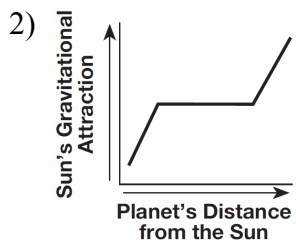
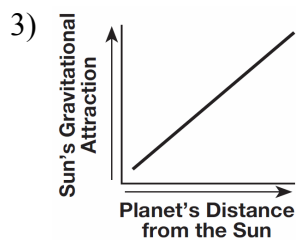
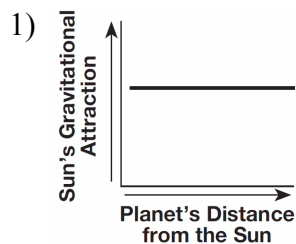


Which equation should be used to find the eccentricity of the Earth's orbit?

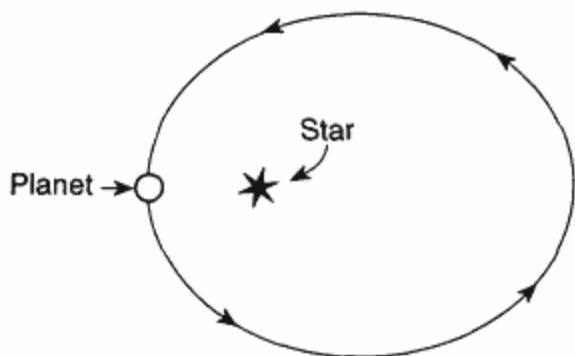
- 1) $\text{eccentricity} = \frac{299,000,000 \text{ km}}{5,000,000 \text{ km}}$
 - 2) $\text{eccentricity} = \frac{5,000,000 \text{ km}}{299,000,000 \text{ km}}$
 - 3) $\text{eccentricity} = 299,000,000 \text{ km} - 5,000,000 \text{ km}$
 - 4) $\text{eccentricity} = \frac{5,000,000 \text{ km}}{299,000,000 \text{ km} - 5,000,000 \text{ km}}$
7. The gravitational attraction between two objects in the solar system is greatest when their masses are
- 1) small, and the objects are close together
 - 2) small, and the objects are far apart
 - 3) large, and the objects are far apart
 - 4) large, and the objects are close together
-

Kepler and the Moon Review

8. Which graph best shows the general relationship between a planet's distance from the Sun and the Sun's gravitational attraction to the planet?



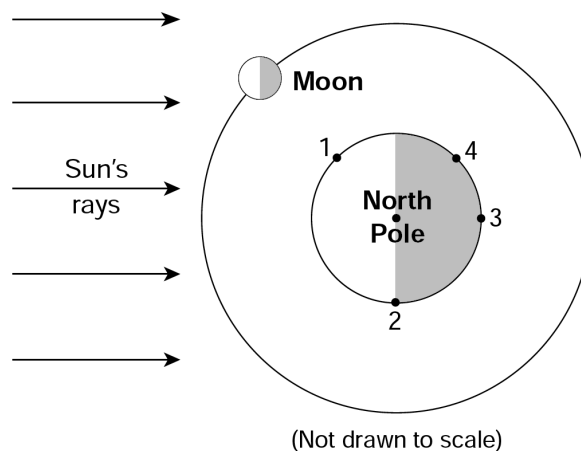
9. The diagram below represents a planet revolving in an elliptical orbit around a star.



As the planet makes one complete revolution around the star, starting at the position shown, the gravitational attraction between the star and the planet will

- 1) decrease, then increase
- 2) increase, then decrease
- 3) continually decrease
- 4) remain the same

10. The diagram below represents the Moon at one position in its orbit around Earth. The numbers represent locations on Earth's surface.

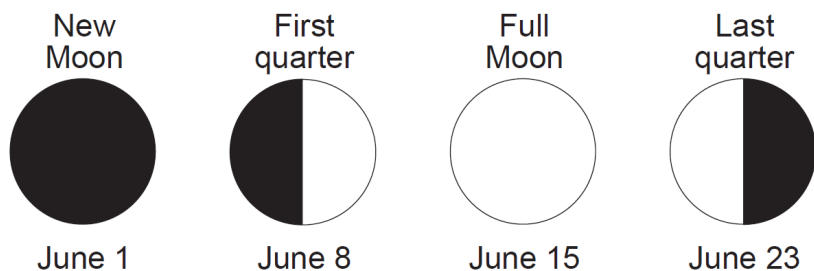


At which numbered location would high tide be occurring when the Moon is in the location shown in the diagram?

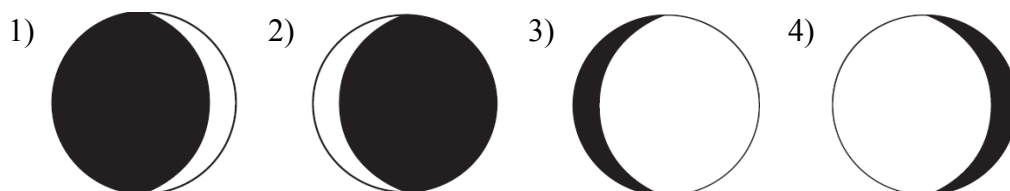
- 1) 1
- 2) 2
- 3) 3
- 4) 4

Kepler and the Moon Review

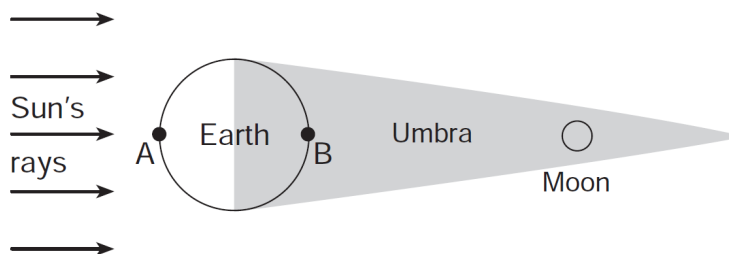
11. The names and appearances of four Moon phases viewed by an observer in New York State in June are shown below.



Which diagram best represents the Moon's appearance on June 3?



12. The diagram below represents the Moon passing through the darker part of Earth's shadow called the umbra. Letters *A* and *B* represent locations on Earth's surface.



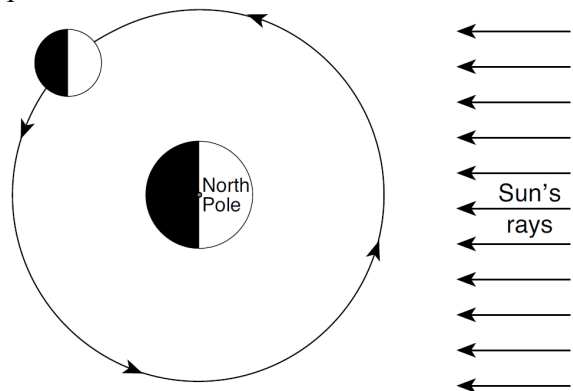
(Not drawn to scale)

Which statement best identifies this event and at which location it would be viewed?

- 1) A solar eclipse is occurring and can be seen from location *A*.
- 2) A solar eclipse is occurring and can be seen from location *B*.
- 3) A lunar eclipse is occurring and can be seen from location *A*.
- 4) A lunar eclipse is occurring and can be seen from location *B*.

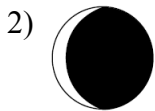
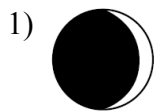
Kepler and the Moon Review

13. The diagram below represents the Moon at one position in its orbit around Earth.



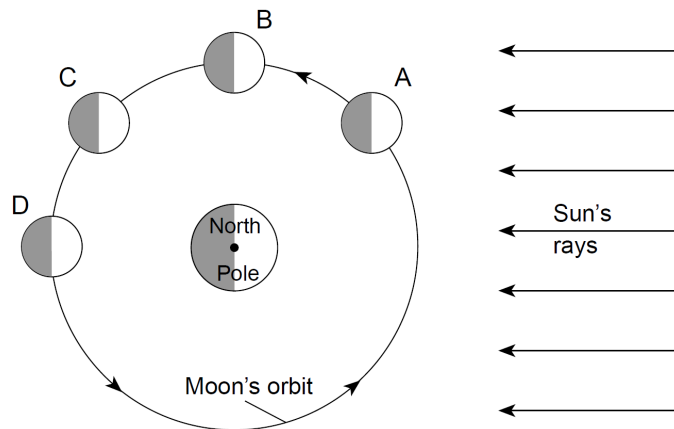
(Not drawn to scale)

Which diagram represents the phase of the Moon as viewed by an observer in New York State when the Moon is located at the position shown?



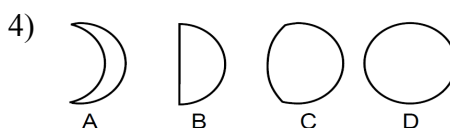
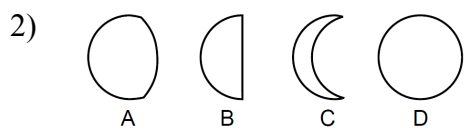
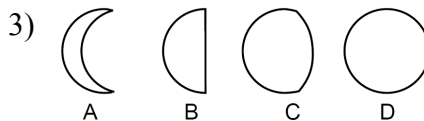
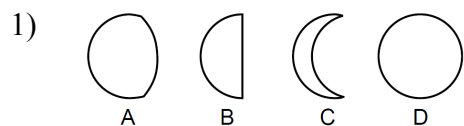
Kepler and the Moon Review

14. The diagram below represents four positions of the Moon, labeled *A* through *D*, as it orbits Earth.



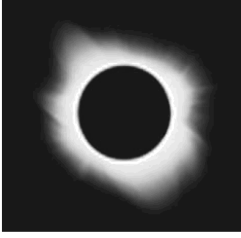
(Not drawn to scale)

Which diagram best represents the sequence of Moon phases, as seen by an observer in New York State, when the Moon travels from position *A* to position *D* in its orbit around Earth?

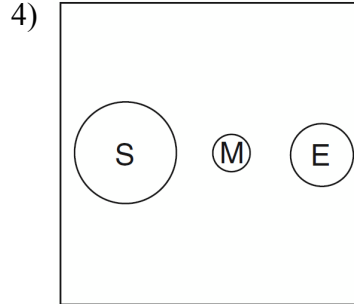
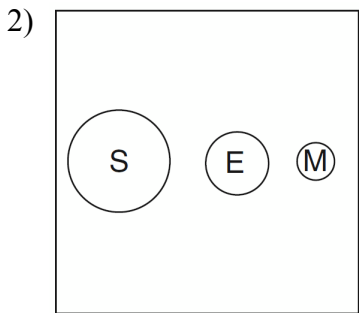
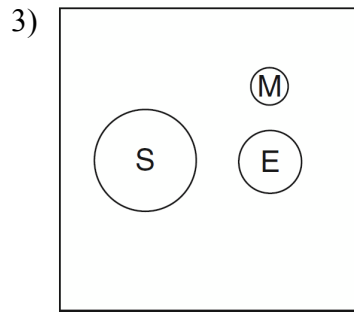
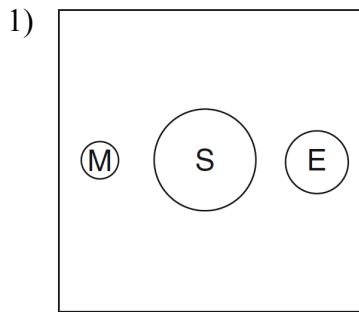


Kepler and the Moon Review

15. The diagram below represents a total solar eclipse as seen from Earth.

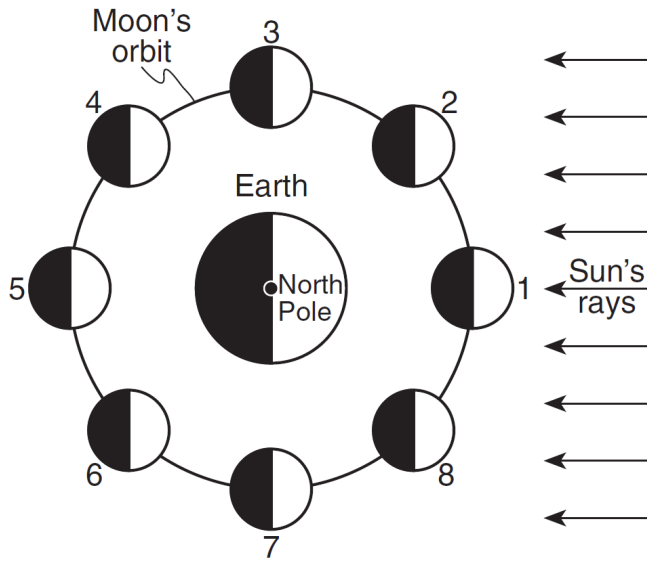


Which diagram correctly represents the relative positions of the Sun (*S*), Earth (*E*), and the Moon (*M*) in space during a total solar eclipse? [The diagrams are not drawn to scale.]



Kepler and the Moon Review

16. The diagram below shows the Moon orbiting Earth, as viewed from space above Earth's North Pole. The Moon is shown at eight positions in its orbit.



(Not drawn to scale)

Spring ocean tides occur when the difference in height between high tide and low tide is greatest. At which two positions of the Moon will spring tides occur on Earth?

- 1) 1 and 5
- 2) 2 and 6
- 3) 3 and 7
- 4) 4 and 8