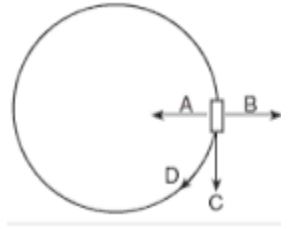


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$$\text{Centripetal Force} = F_C = \frac{mv^2}{r}$$

$$\text{Newton's Universal Law of Gravitation: } F_G = G \frac{m_1 m_2}{r^2}$$

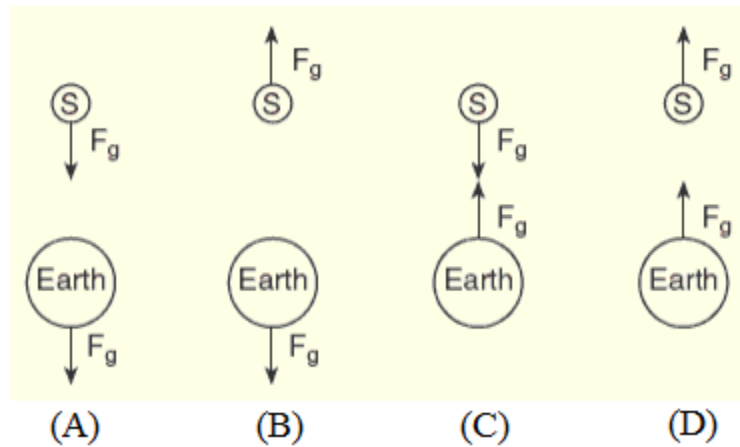


1. The diagram above shows an object in circular motion. Determine which directions are associated with the object's Force, acceleration, and speed.

<u>Force</u>	<u>Acceleration</u>	<u>Speed</u>
(A) Point A	Point A	Point A
(B) Point B	Point A	Point C
(C) Point B	Point B	Point C
(D) Point A	Point A	Point C

2. What is the centripetal force of a 4 kg object moving at 3 m/s at a radius of curvature of 2 m?
- (A) 6 N  
 (B) 18 N  
 (C) 24 N  
 (D) 36 N

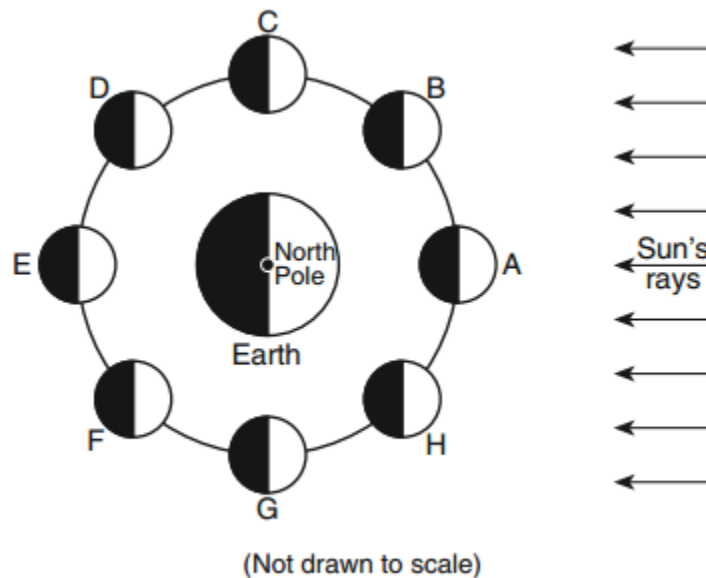
3. Which of the following diagrams best shows the gravitational forces between a satellite, S, and Earth?



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- According to Kepler's First Law of Planetary Motion, satellites will travel around the Earth in:
  - Circles
  - Hyperbolas
  - Round Paths
  - Ellipses
- According to Kepler's Second and Third Laws of Planetary Motion, what is a large difference between the planets Mercury and Neptune?
  - Mercury has a smaller orbital period due to being closer to the sun.
  - Mercury has a larger orbital period due to being closer to the sun.
  - Neptune has a larger orbital period due to being more massive than Mercury.
  - Neptune has a larger orbital period due to having a larger radius than Mercury.

Questions 6-9 refer to the diagram below of 8 different positions and therefore phases of the moon.



- What is the name of the phase of the moon when the moon is at position A?
  - New Moon
  - Full Moon
  - Waxing Crescent
  - Waning Gibbous
- What is the name of the phase of the moon when the moon is at position D?
  - Waxing Crescent
  - Waning Crescent
  - Waxing Gibbous
  - Waning Gibbous

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8. If the moon and Earth are not tilted as compared to the sun but in-line with one another, one is able to cast a shadow on the other. If the moon is at position E and there is a shadow cast, what is this called?
- (A) New Eclipse
  - (B) Full Eclipse
  - (C) Solar Eclipse
  - (D) Lunar Eclipse
9. If the moon is at position C with respect to the sun, what tide is present on Earth?
- (A) High Tide
  - (B) Low Tide
  - (C) Spring Tide
  - (D) Neap Tide
10. When a solar eclipse casts a very dark, cone-shaped shadow on a specific spot on the Earth where the sun's corona can be seen, what is this spot called?
- (A) Penumbra
  - (B) Umbra
  - (C) Night
  - (D) Mordor