



Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

1 The diagram below shows four different locations of a satellite in its elliptical orbit about Earth.

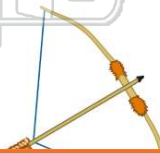
At which location is the magnitude of the satellite's velocity **greatest**?

- A 1
- B 2
- C 3
- D 4



3 The **path of a projectile** fired at a **30° angle** to the horizontal is best described as

- A parabolic
- B linear
- C circular



2 Which statement is consistent with **Kepler's laws of planetary motion**?

- A The planets move at a constant speed around the Sun.
- B The speed of a planet is directly proportional to the radius of the path of motion.
- C The more massive the planet, the slower the planet moves around the Sun.
- D An imaginary line from a planet to the Sun sweeps out equal areas in equal time intervals.

4 A projectile is launched with an initial velocity of **200 meters per second** at an angle of **30°** above the horizontal. **What is the magnitude of the vertical component of the projectile's initial velocity?**

- A  $200 \text{ m/s} \times \cos 30^\circ$
- B  $200 \text{ m/s} \times \sin 30^\circ$

5



## PREVIEW

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7

- A  $1 \text{ m/s}^2$
- B  $2 \text{ m/s}^2$
- C  $0.2 \text{ m/s}^2$
- D  $0.5 \text{ m/s}^2$



of satellite B?

- A  $2.7 \times 10^3 \text{ kg}$
- B  $2.0 \times 10^3 \text{ kg}$
- C  $1.5 \times 10^3 \text{ kg}$
- D  $1.1 \times 10^3 \text{ kg}$



9

The radius of Mars is approximately **one-half** the radius of Earth, and the mass of Mars is approximately **one-tenth** the mass of Earth. Compared to the acceleration due to gravity on the surface of Earth, **the acceleration due to gravity on the surface of Mars is**

- A smaller
- B larger
- C the same



10

A student throws a stone **upward** at an angle of **45°**. **Which statement best describes the stone at the highest point that it reaches?**

- A Its acceleration is zero.
- B Its acceleration is at a maximum.
- C Its potential energy is at a minimum.
- D Its kinetic energy is at a minimum.

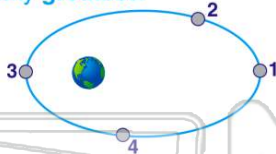


## ANSWER KEY

The diagram below shows four different locations of a satellite in its elliptical orbit about Earth.

At which location is the magnitude of the satellite's velocity **greatest**?

- A 1
- B 2
- C 3
- D 4



(C)

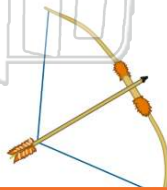
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- C The more massive the planet, the slower the planet moves around the Sun.
- D An imaginary line from a planet to the Sun sweeps out equal areas in equal time intervals.

(d)

The **path of a projectile** fired at a **30° angle** to the horizontal is best described as

- A parabolic
- B linear
- C circular
- D hyperbolic



(a)

A projectile is launched with an initial velocity of **200 meters per second** at an angle of **30°** above the horizontal. **What is the magnitude of the vertical component of the projectile's initial velocity?**

- A  $200 \text{ m/s} \times \cos 30^\circ$
- B  $200 \text{ m/s} \times \sin 30^\circ$
- C  $200 \text{ m/s} / \sin 30^\circ$

(b)



## PREVIEW

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- B  $2 \text{ m/s}^2$
- C  $0.2 \text{ m/s}^2$
- D  $0.5 \text{ m/s}^2$



- A  $2.7 \times 10^3 \text{ kg}$
- B  $2.0 \times 10^3 \text{ kg}$
- C  $1.5 \times 10^3 \text{ kg}$
- D  $1.1 \times 10^3 \text{ kg}$



The radius of Mars is approximately **one-half** the radius of Earth, and the mass of Mars is approximately **one-tenth** the mass of Earth. Compared to the acceleration due to gravity on the surface of Earth, **the acceleration due to gravity on the surface of Mars is**

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- C the same



(a)

A student throws a stone **upward** at an angle of **45°**. **Which statement best describes the stone at the highest point that it reaches?**

- A Its acceleration is zero.
- B Its acceleration is at a maximum.
- C Its potential energy is at a minimum.
- D Its kinetic energy is at a minimum.

(d)