Question 1

A ball travels on a horizontal surface in a circle at a constant speed.

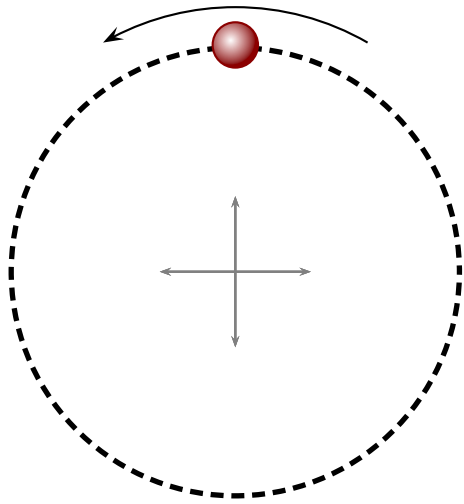Instant 1
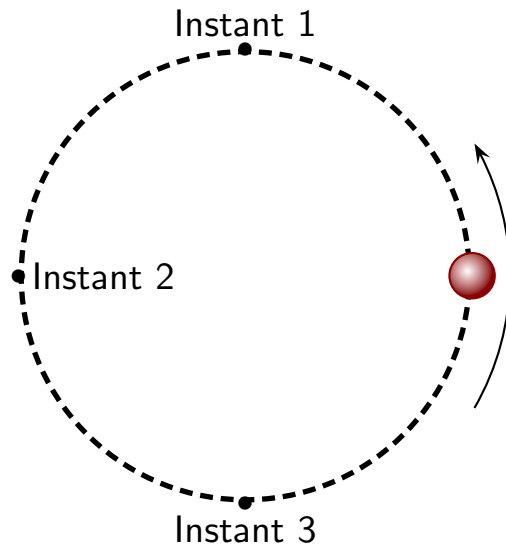
Instant 2

Instant 3

Which of the following is true?

1. The velocity of the ball is the same at all three instants.

2. The velocities of the ball at instants 1 and 3 are the same but different from instant 2.

3. The velocities of the ball at all three instants are different.

Question 2

A ball travels on a horizontal surface in a circle at a constant speed.

Using a coordinate system with origin at the center of the circle, which of the following is true of the velocity at the illustrated moment?

1. $v_x = 0$ and $v_y > 0$.

2. $v_x = 0$ and $v_y < 0$.

3. $v_x > 0$ and $v_y = 0$.

4. $v_x < 0$ and $v_y = 0$.

5. $v_x < 0$ and $v_y > 0$.

Question 3

A projectile follows the indicated trajectory. Its positions at two instants are indicated and at these instants its speeds are the same.
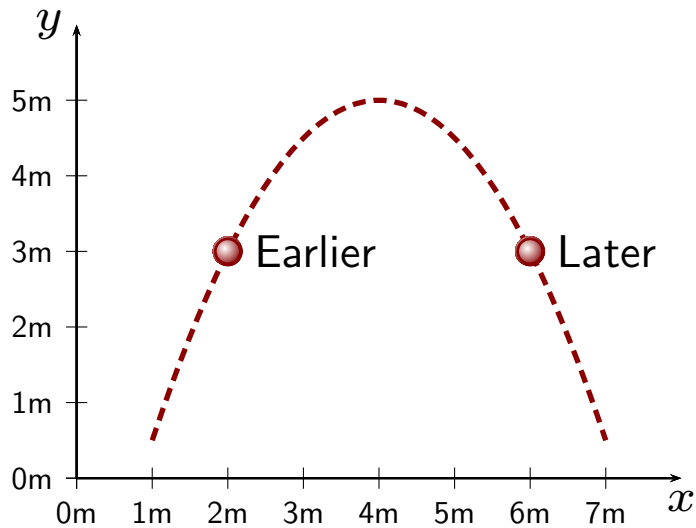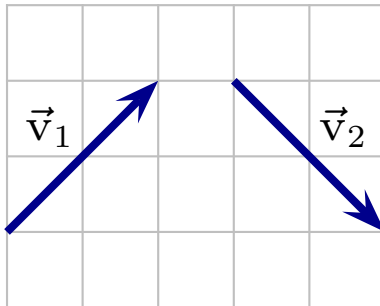

Let $\vec{v}_i$ be the velocity at the earlier instant and $\vec{v}_f$ be the velocity at the later instant. Which of the following is true about the components of the velocity?

1. $v_{ix} = v_{fx}$ and $v_{iy} = v_{fy}$

2. $v_{ix} = v_{fx}$ and $v_{iy} \neq v_{fy}$

3. $v_{ix} \neq v_{fx}$ and $v_{iy} = v_{fy}$

4. $v_{ix} \neq v_{fx}$ and $v_{iy} \neq v_{fy}$

Question 4

Consider a particle whose velocity vectors at two moments $2.0\,\mathrm{s}$ apart are as illustrated.

Which of the following best represents the average acceleration during this period?