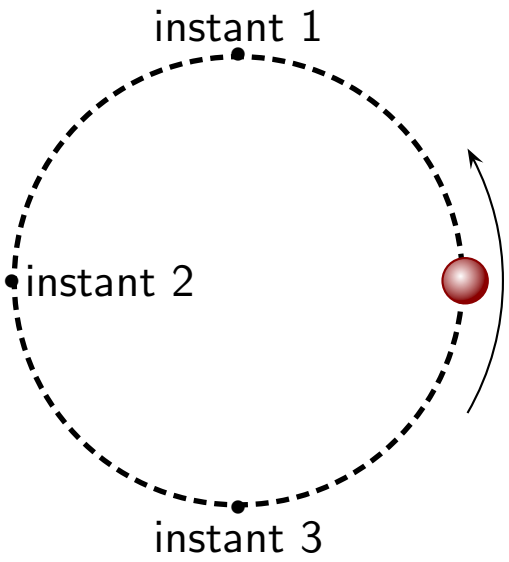
Question 1

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

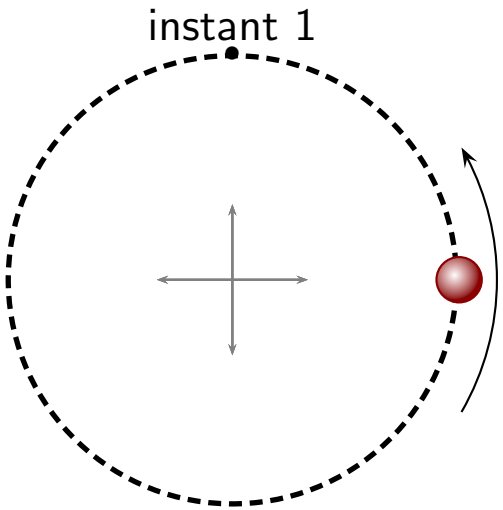


Which of the following is true?

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.

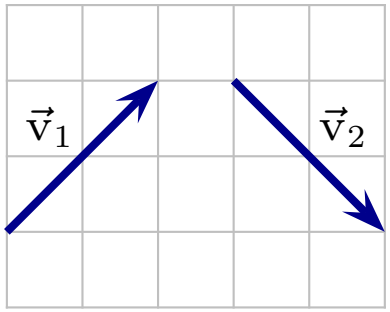


Using a coordinate system with origin at the center of the circle, which of the following is true of the velocity at instant 1?

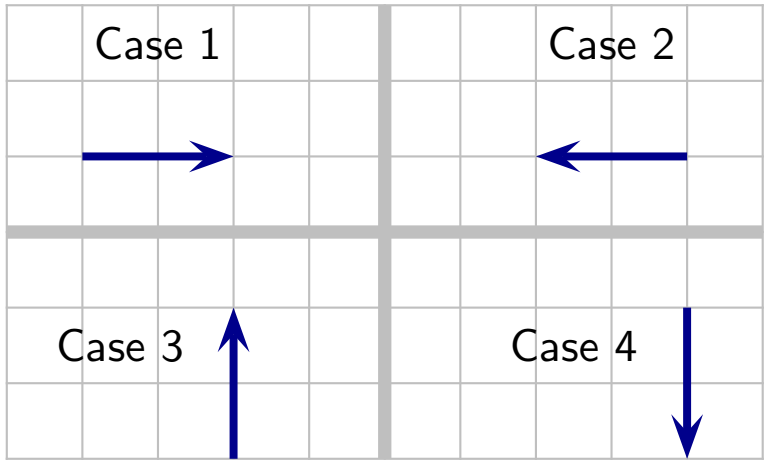
1. $v_x = 0$ and $v_y = 0$.
2. $v_x = 0$ and $v_y > 0$.
3. $v_x < 0$ and $v_y = 0$.
4. $v_x < 0$ and $v_y > 0$.
5. $v_x > 0$ and $v_y = 0$.

Question 3

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

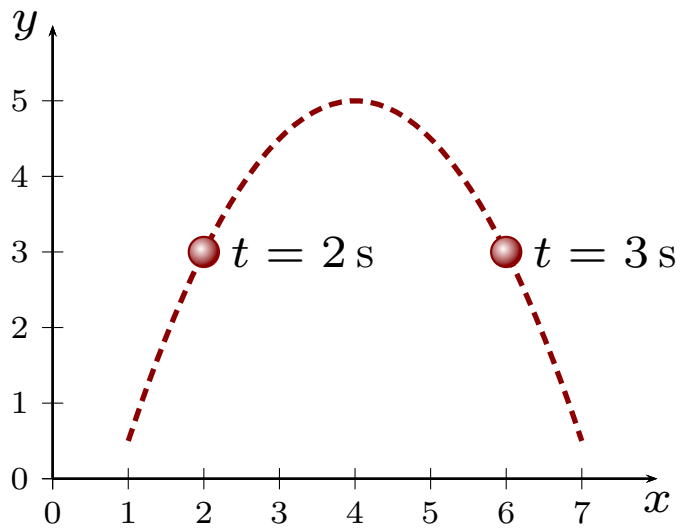


Which of the following best represents the average acceleration during this period?



Question 4

A projectile moves along the indicated trajectory.



Which of the following is true regarding the average acceleration between the two instants?

1. Acceleration is zero.
2. $\vec{a}_{\text{avg}}$ has direction ←.
3. $\vec{a}_{\text{avg}}$ has direction →.
4. $\vec{a}_{\text{avg}}$ has direction ↓.
5. $\vec{a}_{\text{avg}}$ has direction ↘.