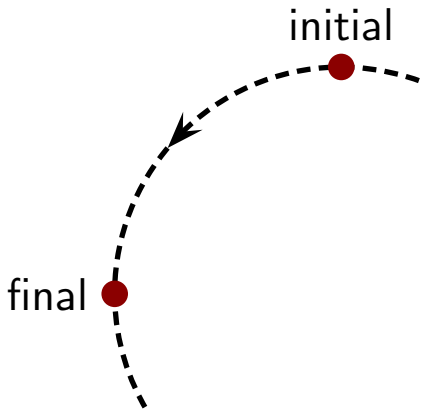
Warm Up Question 1

A ball, held by a string, swings in a circle with constant speed. Is the acceleration zero or non-zero? Is it constant or not? Explain your answer.

1. Zero. The speed doesn't change.
2. Non-zero. Direction is always changing.

Question 1

A bug moves along a circular arc at a constant speed.



Which of the following is true about the average acceleration from the initial instant to the final instant as illustrated?

1. $\vec{a}_{av} = 0$
2. $\vec{a}_{av} \neq 0$ with direction ←
3. $\vec{a}_{av} \neq 0$ with direction ↓
4. $\vec{a}_{av} \neq 0$ with direction ↘
5. $\vec{a}_{av} \neq 0$ with direction ↙

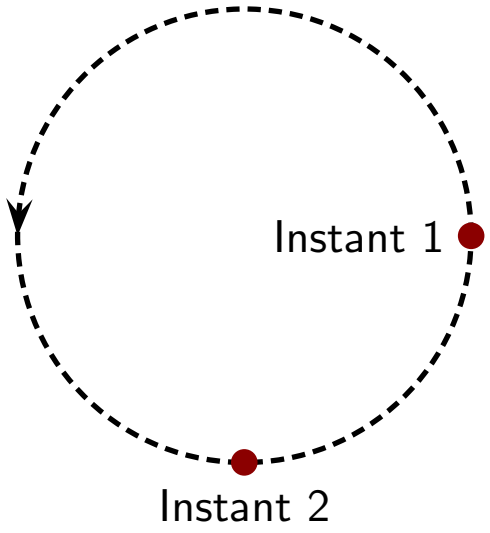
Warm Up Question 2

A cart travels along a track, which contains a dip. The dip has a circular cross-section. The cart carefully maneuvers through the dip at a constant speed. Which way does the acceleration, if there is any, of the cart point as it passes the bottom of the dip?

1. Towards the center. Centripetal acceleration.
2. Towards the ground. Gravity.
3. Acceleration is zero.
4. Straight up. Centripetal acceleration.
5. Right (if it moves right). Direction of motion.

Question 2

A bug moves along a circular path at a constant speed.

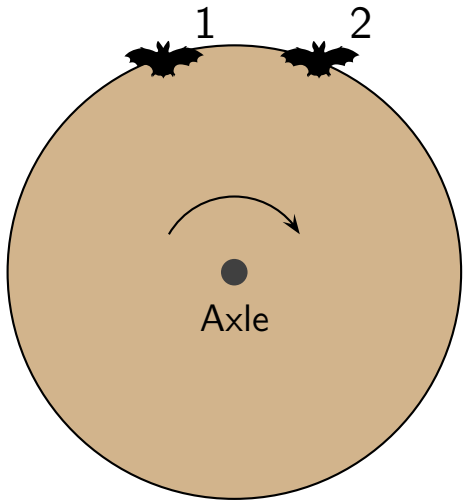


Which of the following is most accurate about the accelerations at the indicated instants?

1. They are both zero.
2. They are non-zero and identical.
3. They are non-zero and opposite.
4. They are non-zero and different.

Question 3

A bat clings to the edge of a wheel. The wheel rotates clockwise about an axle through its center, speeding up at a constant rate. The bat's location is shown at two instants.



Which of the following is true about the average acceleration from instant 1 to instant 2 as illustrated?

1. $\vec{a}_{av} = 0$
2. $\vec{a}_{av} \neq 0$ with direction →
3. $\vec{a}_{av} \neq 0$ with direction ↓
4. $\vec{a}_{av} \neq 0$ with direction ↘
5. $\vec{a}_{av} \neq 0$ with direction ↙
6. $\vec{a}_{av} \neq 0$ with direction ↗