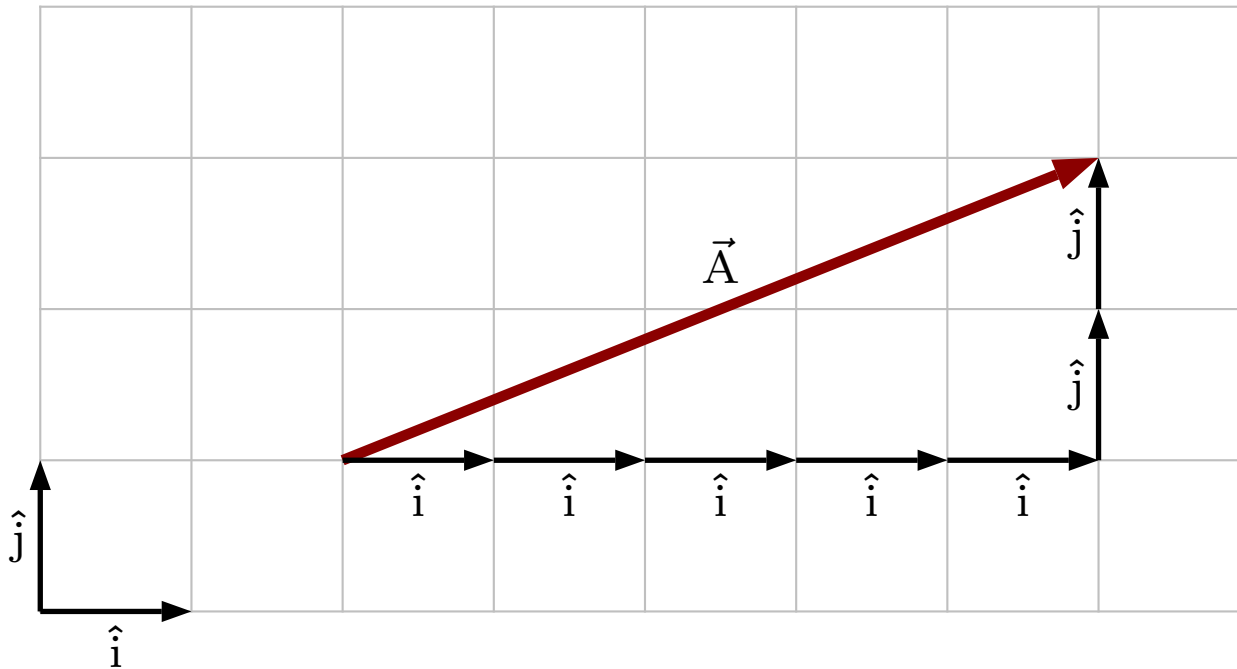# Constructing a Vector from Unit Vectors

How the illustrated vector $\vec{A}$ is decomposed into unit vectors

$$\vec{A} = 5\hat{i} + 2\hat{j}$$

Constructing a Vector from Unit Vectors

How the illustrated vector $\vec{A}$ is decomposed into unit vectors

$$\vec{A} = -4\hat{i} + 2\hat{j}$$

Constructing a Vector from Unit Vectors

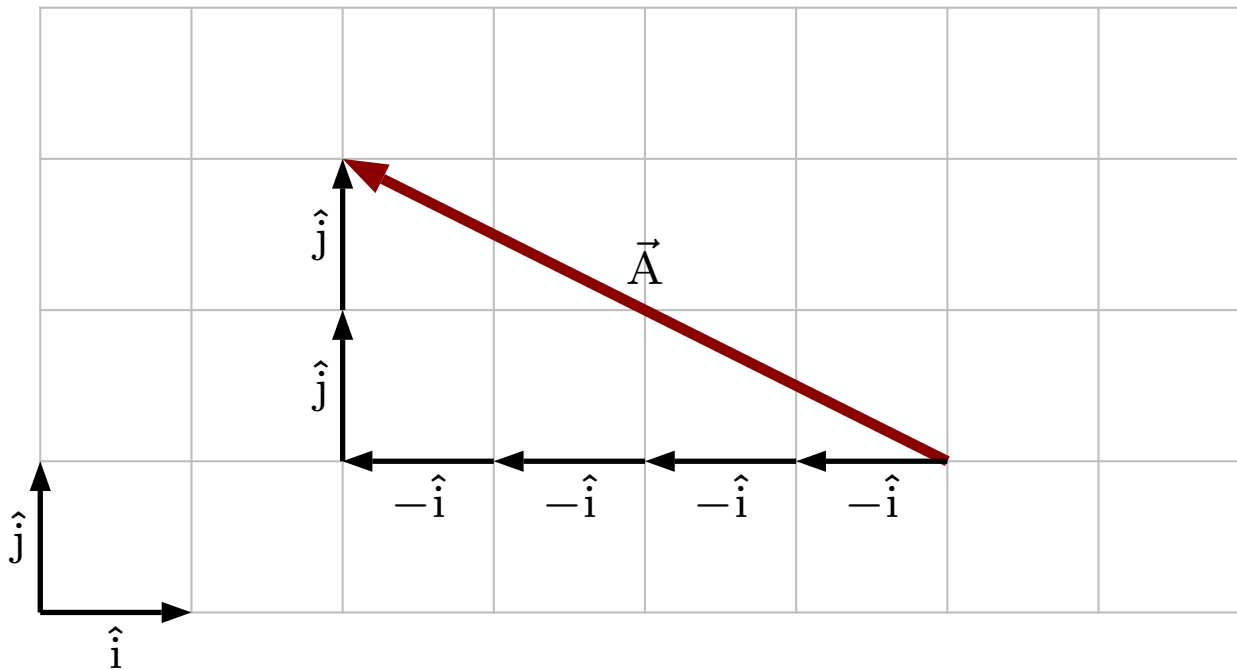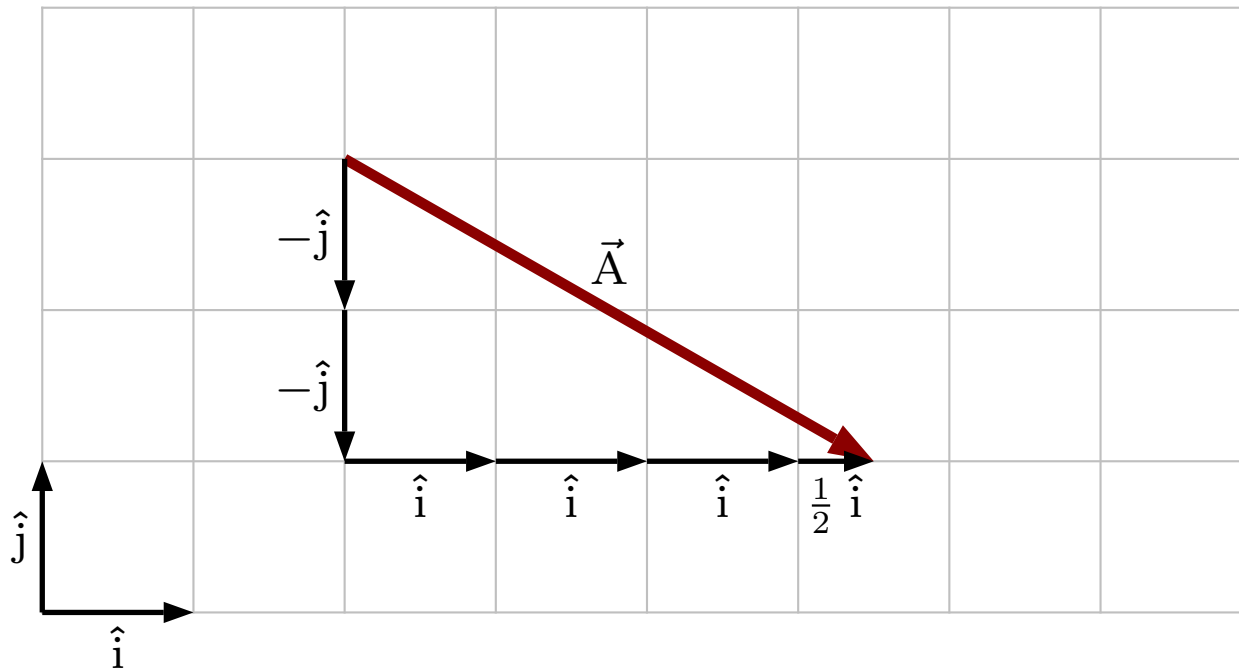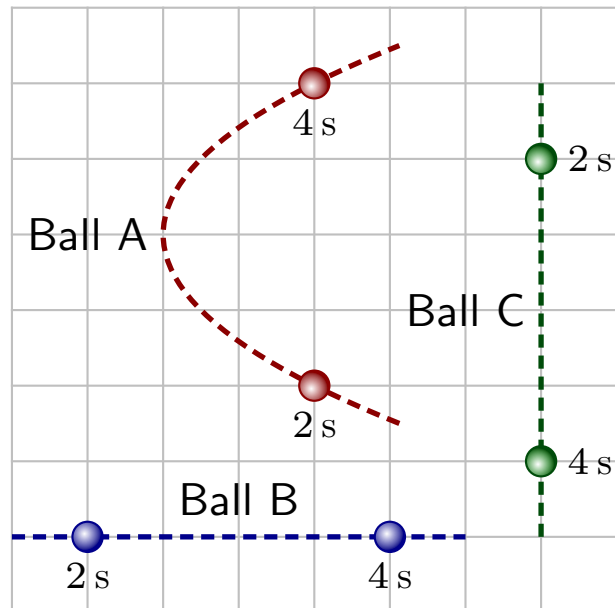How the illustrated vector $\vec{A}$ is decomposed into unit vectors

$$\vec{A} = 3.5\hat{i} - 2\hat{j}$$

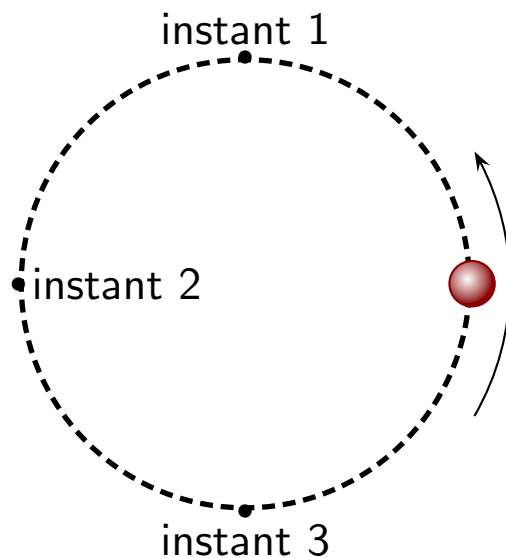# Question 1

Various balls follow the illustrated trajectories.

Which balls have the same average velocity in the interval from $2\,\mathrm{s}$ to $4\,\mathrm{s}$?

1. All have the same.

2. None have the same.

3. A and B.

4. B and C.

5. A and C.

Question 2

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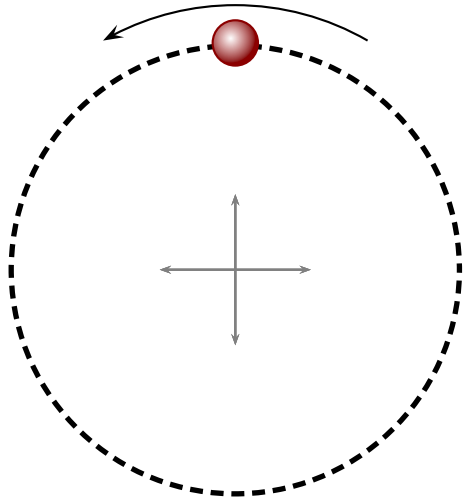

Which of the following is true?

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 3

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 4

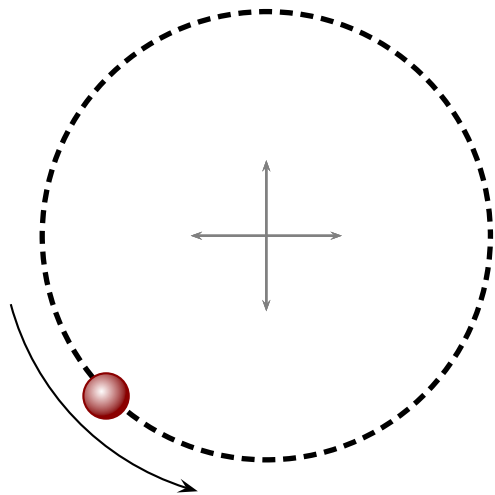A ball travels on a horizontal surface in a circle at a constant speed.

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 $v_y = 0$.

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