

# Question 1

A man is observed while moving and his velocities at various instants are listed below:

| Time  | Velocity |
|-------|----------|
| 0.0 s | -6.0 m/s |
| 1.0 s | -4.0 m/s |
| 2.0 s | -2.0 m/s |
| 3.0 s | 0.0 m/s  |
| 4.0 s | 2.0 m/s  |
| 5.0 s | 4.0 m/s  |

Which of the following is the average acceleration from 4.0 s to 5.0 s?

1.  $a_{\text{avg}} = 0.0 \text{ m/s}^2$
2.  $a_{\text{avg}} = 0.5 \text{ m/s}^2$
3.  $a_{\text{avg}} = 1.0 \text{ m/s}^2$
4.  $a_{\text{avg}} = 2.0 \text{ m/s}^2$
5.  $a_{\text{avg}} = 4.0 \text{ m/s}^2$

## Question 2

A man is observed while moving and his velocities at various instants are listed below:

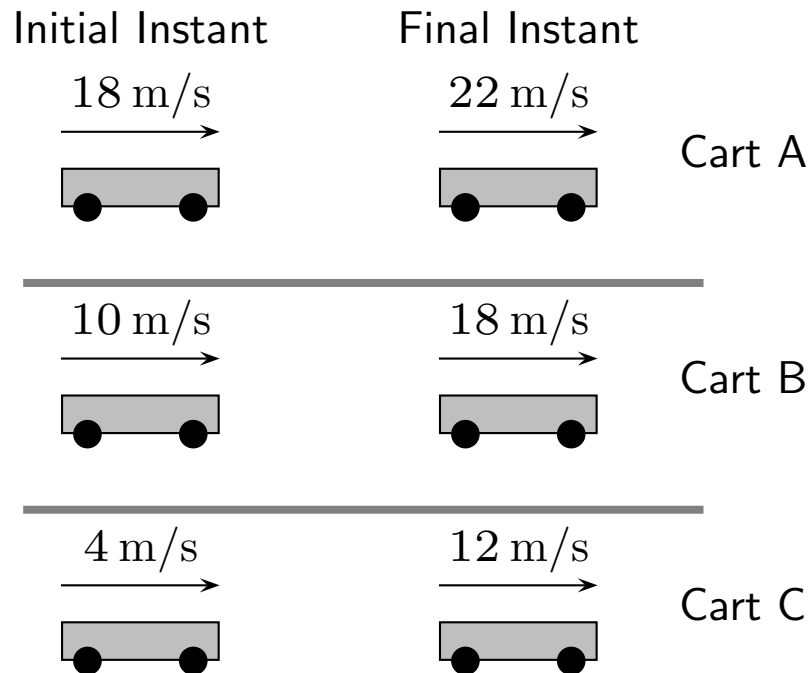
| Time  | Velocity |
|-------|----------|
| 0.0 s | -6.0 m/s |
| 1.0 s | -4.0 m/s |
| 2.0 s | -2.0 m/s |
| 3.0 s | 0.0 m/s  |
| 4.0 s | 2.0 m/s  |
| 5.0 s | 4.0 m/s  |

Which of the following is the average acceleration from 0.0 s to 1.0 s?

1.  $a_{\text{avg}} = -6.0 \text{ m/s}^2$
2.  $a_{\text{avg}} = -4.0 \text{ m/s}^2$
3.  $a_{\text{avg}} = -2.0 \text{ m/s}^2$
4.  $a_{\text{avg}} = +2.0 \text{ m/s}^2$
5.  $a_{\text{avg}} = +4.0 \text{ m/s}^2$

## Question 3

Various carts slide along tracks and their speeds at two instants separated by 2.0 s are as indicated.



Which of the following is true regarding the size of the accelerations?

1. Same for all.
2. A smallest, C middle, B largest
3. C smallest, B middle, A largest
4. B and C same, A larger.
5. B and C same, A smaller.

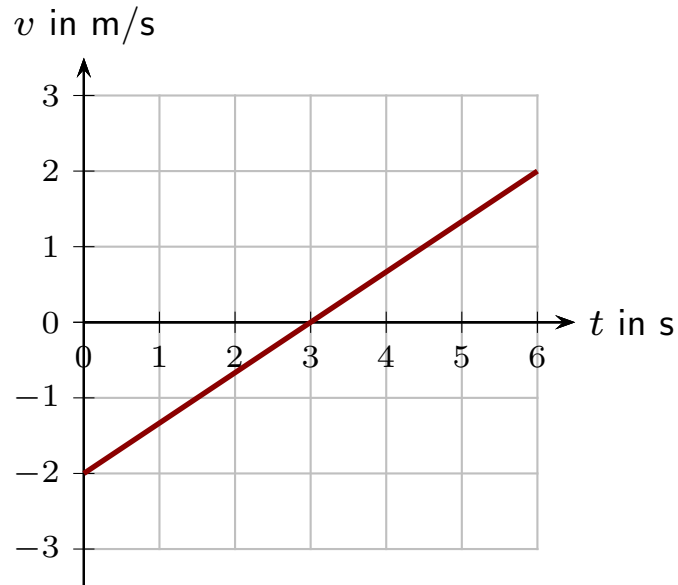
# Warm Up Question 1

At one (initial) instant, a cyclist has a velocity of  $-10 \text{ m/s}$ , and at all later times she has an acceleration of  $2.0 \text{ m/s}^2$ . What is the cyclist's velocity at an instant  $3.0 \text{ s}$  after the initial instant? Did she speed up or slow down? Explain your answer.

1.  $16 \text{ m/s}$  since speed increases by  $2 \text{ m/s}$  each second.
2.  $6 \text{ m/s}$  since  $a = \frac{v}{t}$ .
3.  $-4 \text{ m/s}$  since velocity increases by  $6 \text{ m/s}$ .
4.  $-6 \text{ m/s}$
5.  $-16 \text{ m/s}$  since speed increases by  $2 \text{ m/s}$  each second.

## Question 4

A graph of velocity vs. time for an object moving in one dimension is illustrated.

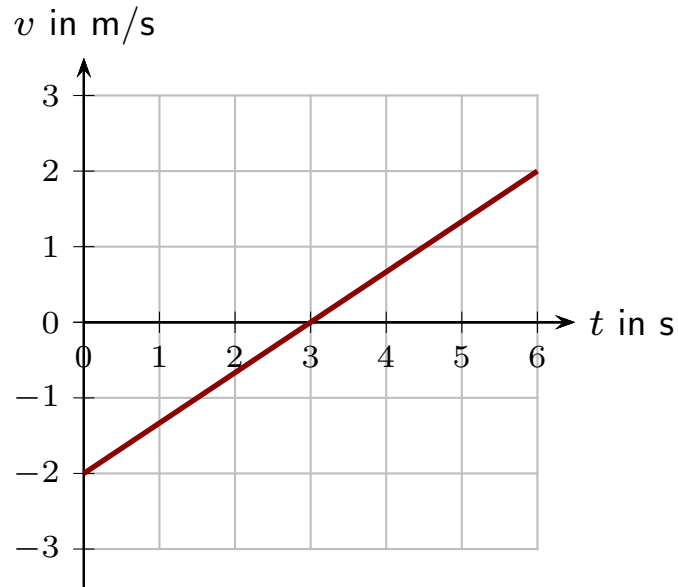


Which of the following is true about the object's motion during the period from 0 s to 6 s?

1. It is always speeding up.
2. It is always slowing down.
3. At some times it is speeding up; at others it is slowing down.

## Question 5

A graph of velocity vs. time for an object moving in one dimension is illustrated.

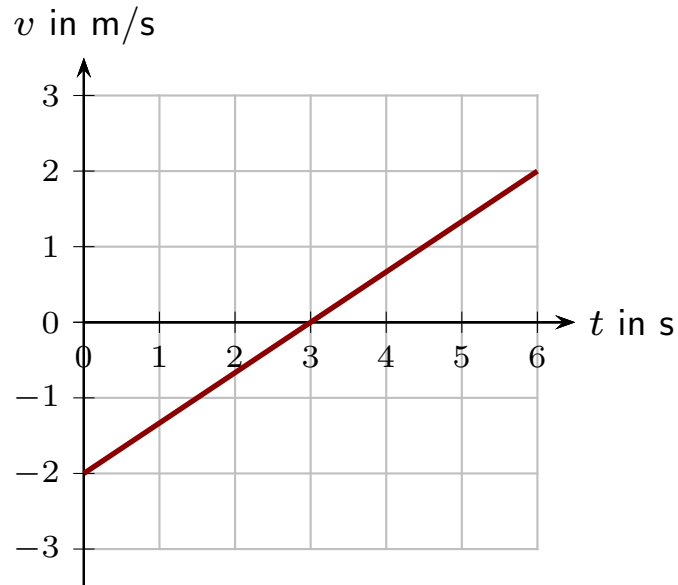


Which of the following is true during the period from 0 s to 6 s?

1. Acceleration is zero.
2. Acceleration is always positive.
3. Acceleration is always negative.
4. At some times acceleration is positive; at others it is negative.

## Question 6

A graph of velocity vs. time for an object moving in one dimension is illustrated.



Which of the following is true about the object's motion during the period from 0 s to 6 s?

1. Acceleration is zero.
2. Acceleration is always positive.
3. Acceleration is always negative.
4. At some times acceleration is positive; at others it is negative.

## Warm Up Question 2

A hockey puck moves right with speed  $20 \text{ m/s}$ , hits a wall and bounces. After this it moves left with speed  $20 \text{ m/s}$ . Is the average acceleration of the puck from the moment just before it hits the wall until the moment just after it bounces back zero, positive or negative? Explain your answer.

1. Zero. Speed does not change.
2. Zero. Velocity is zero when it hits the wall.
3. Positive. It moves right.
4. Negative. It moves left.
5. Positive before, negative after. Direction of motion.



## Question 7

A cart slides to the left with constantly increasing *speed*.

Which of the following is true?

1. The average acceleration is positive.
2. The average acceleration is negative.
3. The average acceleration is negative if the cart is right of the origin but positive if it is left of the origin.
4. The average acceleration is negative if the cart is left of the origin but positive if it is right of the origin.
5. The average acceleration is zero.