

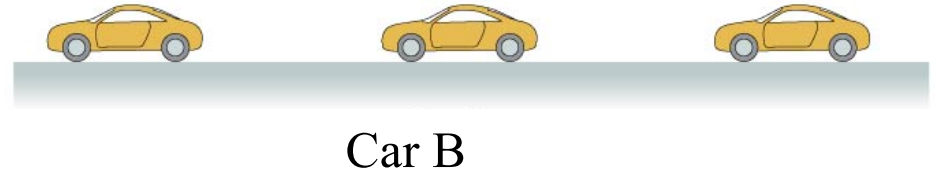
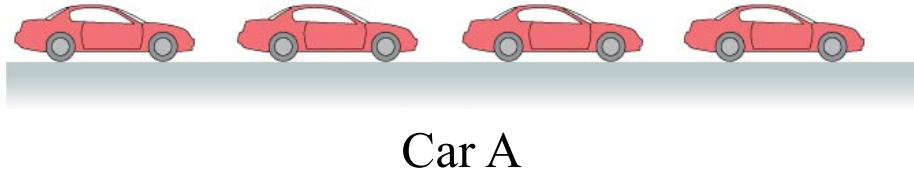
# PHYSICS

FOR SCIENTISTS AND ENGINEERS A STRATEGIC APPROACH 4/E

## Chapter 1 QuickCheck Questions

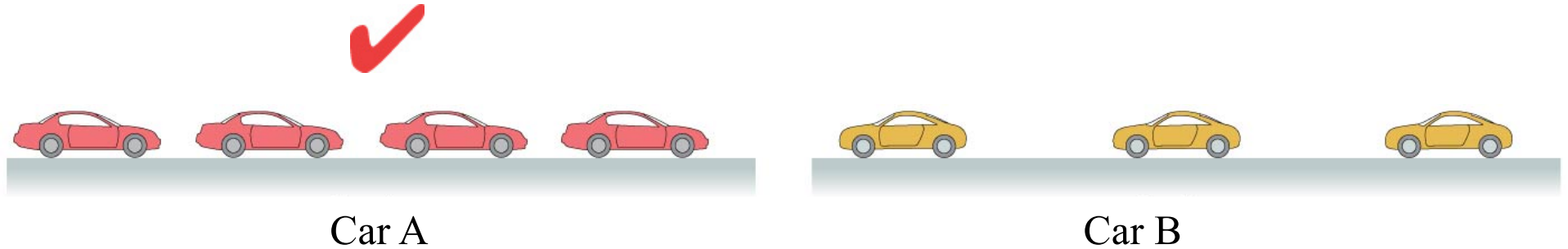
RANDALL D. KNIGHT

# QuickCheck 1.1



Motion diagrams are made of two cars. Both have the same time interval between photos. Which car, A or B, is going slower?

# QuickCheck 1.1

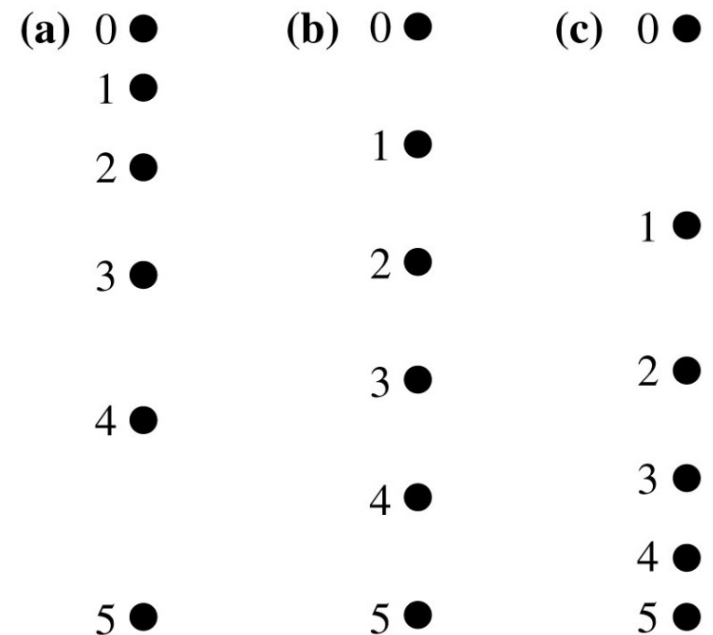


Motion diagrams are made of two cars. Both have the same time interval between photos. Which car, A or B, is going slower?

## QuickCheck 1.2

Three motion diagrams are shown. Which is a dust particle settling to the floor at constant speed, which is a ball dropped from the roof of a building, and which is a descending rocket slowing to make a soft landing on Mars?

- A. (a) is dust, (b) is ball, (c) is rocket.
- B. (a) is ball, (b) is dust, (c) is rocket.
- C. (a) is rocket, (b) is dust, (c) is ball.
- D. (a) is rocket, (b) is ball, (c) is dust.
- E. (a) is ball, (b) is rocket, (c) is dust.



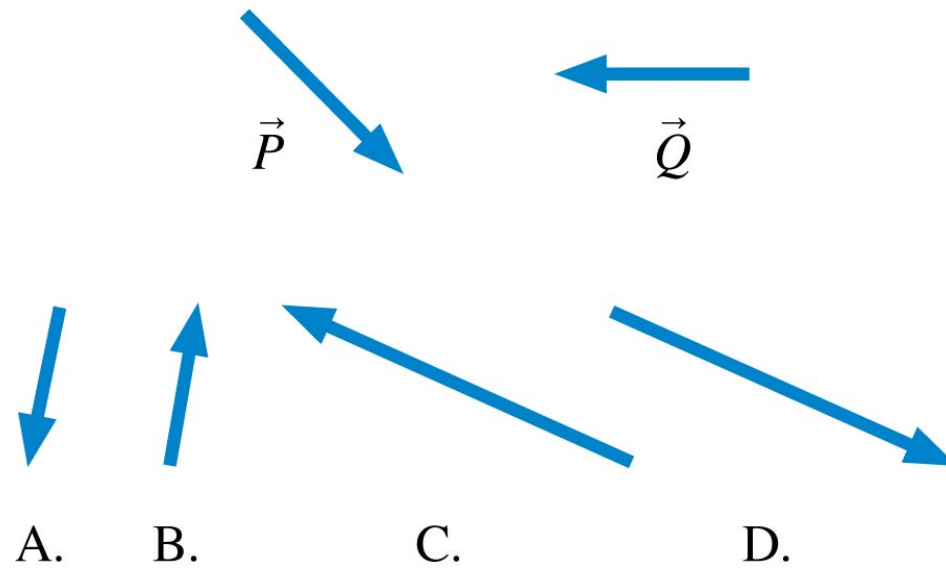
## QuickCheck 1.2

Three motion diagrams are shown. Which is a dust particle settling to the floor at constant speed, which is a ball dropped from the roof of a building, and which is a descending rocket slowing to make a soft landing on Mars?

- |   | (a) 0 ● | (b) 0 ● | (c) 0 ● |
|---|---------|---------|---------|
| A. (a) is dust, (b) is ball, (c) is rocket.   | 1 ●     |         |         |
| ✓ B. (a) is ball, (b) is dust, (c) is rocket. | 2 ●     | 1 ●     |         |
| C. (a) is rocket, (b) is dust, (c) is ball.   |         | 2 ●     | 1 ●     |
| D. (a) is rocket, (b) is ball, (c) is dust.   | 3 ●     | 3 ●     | 2 ●     |
| E. (a) is ball, (b) is rocket, (c) is dust.   | 4 ●     | 4 ●     | 3 ●     |
|   | 5 ●     | 5 ●     | 4 ●     |
|   |         |         | 5 ●     |

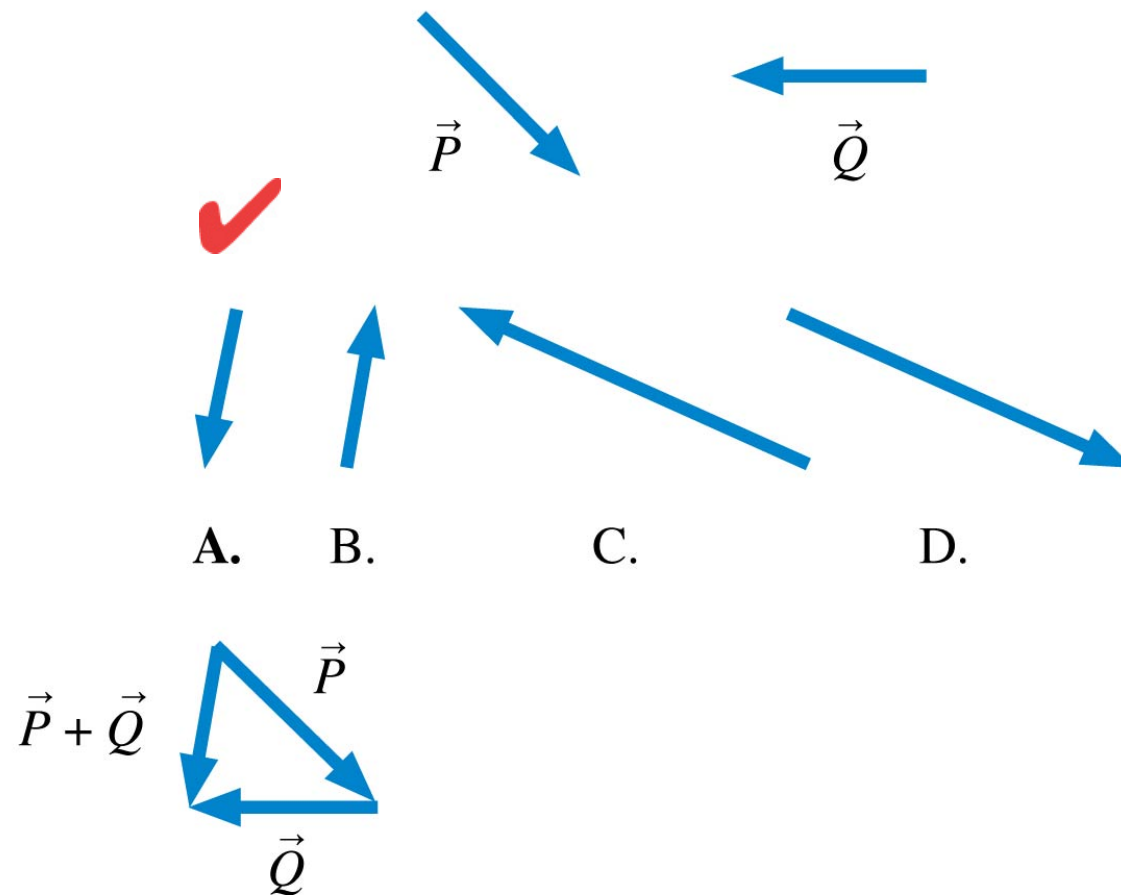
## QuickCheck 1.3

Given vectors  $\vec{P}$  and  $\vec{Q}$ , what is  $\vec{P} + \vec{Q}$ ?



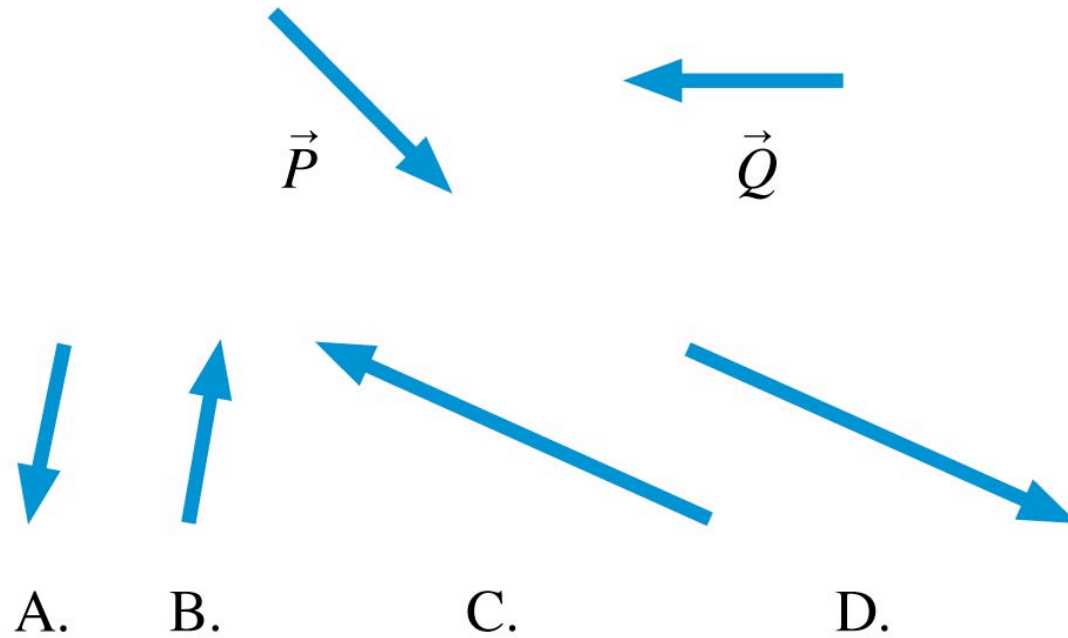
## QuickCheck 1.3

Given vectors  $\vec{P}$  and  $\vec{Q}$ , what is  $\vec{P} + \vec{Q}$ ?



## QuickCheck 1.4

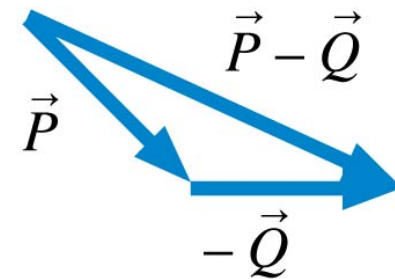
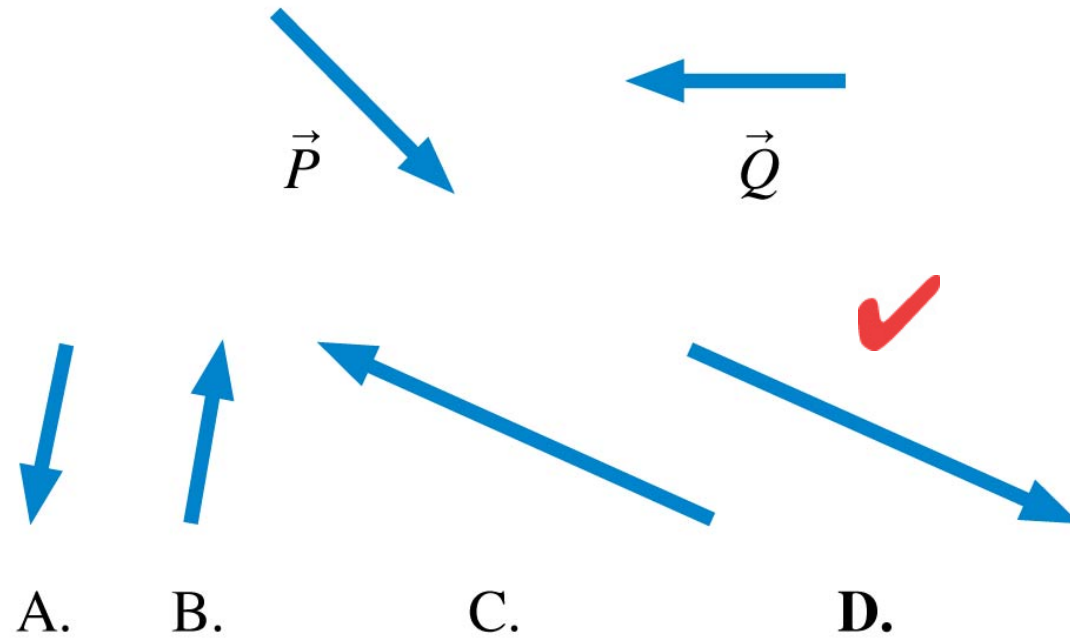
Given vectors  $\vec{P}$  and  $\vec{Q}$ , what is  $\vec{P} - \vec{Q}$ ?





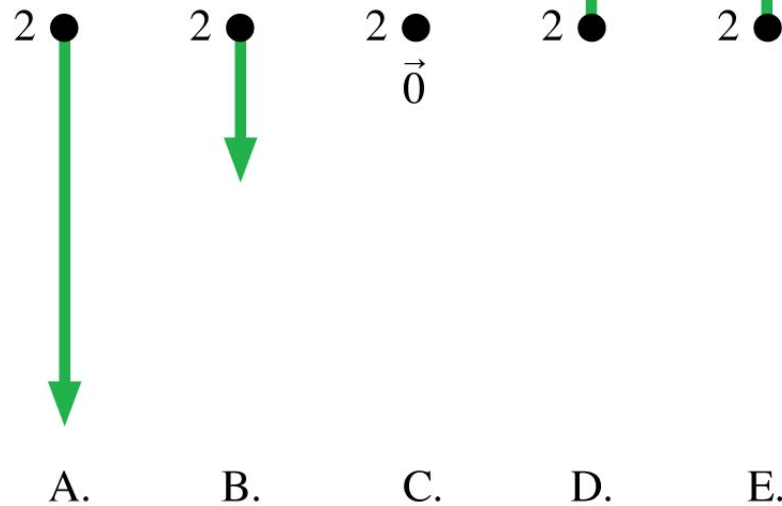
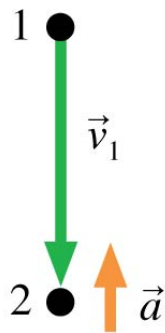
## QuickCheck 1.4

Given vectors  $\vec{P}$  and  $\vec{Q}$ , what is  $\vec{P} - \vec{Q}$ ?



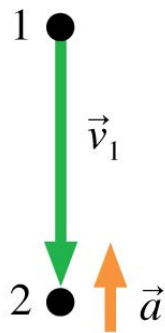
## QuickCheck 1.5

A particle has velocity  $\vec{v}_1$  as it accelerates from 1 to 2. What is its velocity vector  $\vec{v}_2$  as it moves away from point 2 on its way to point 3?

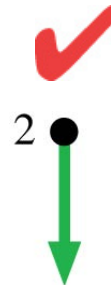


## QuickCheck 1.5

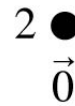
A particle has velocity  $\vec{v}_1$  as it accelerates from 1 to 2. What is its velocity vector  $\vec{v}_2$  as it moves away from point 2 on its way to point 3?



A.



B.



C.



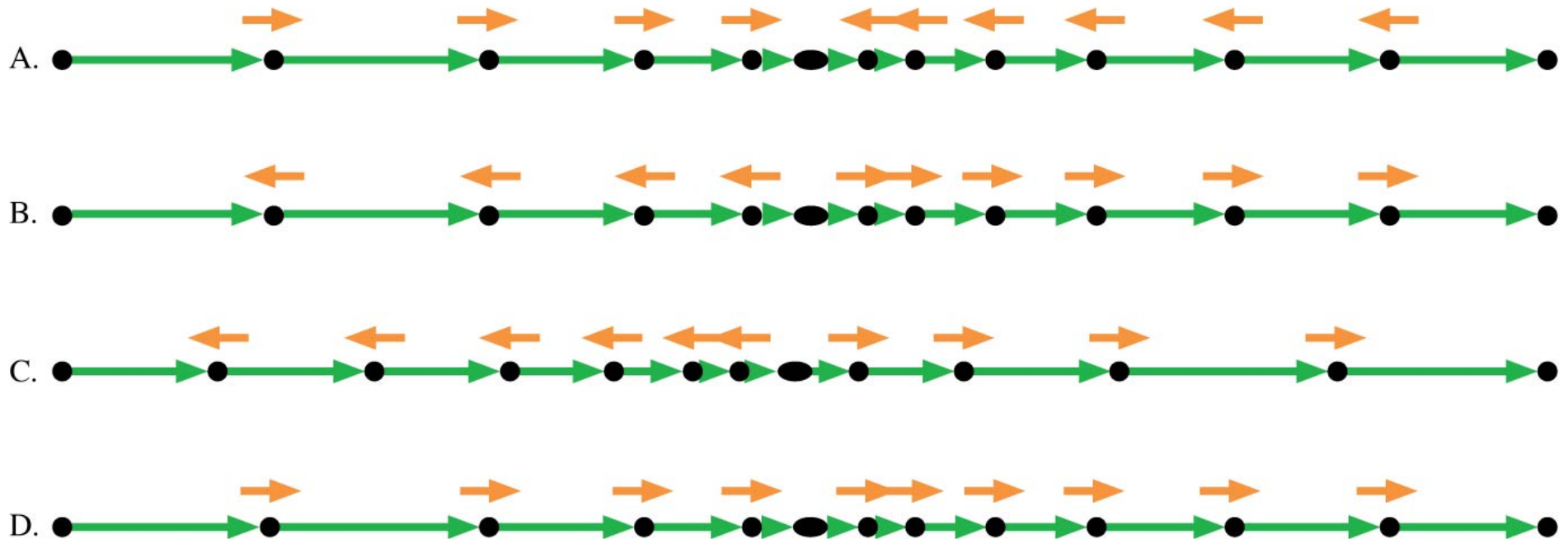
D.



E.

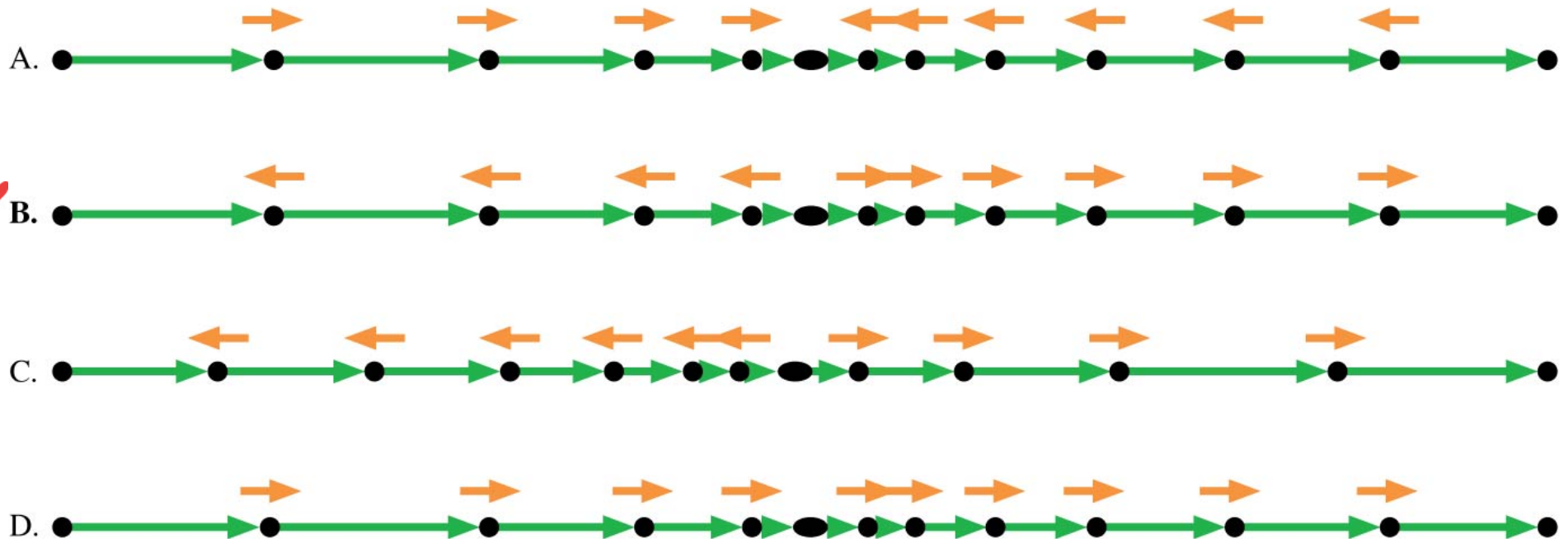
## QuickCheck 1.6

A cyclist riding at 20 mph sees a stop sign and actually comes to a complete stop in 4 s. He then, in 6 s, returns to a speed of 15 mph. Which is his motion diagram?



## QuickCheck 1.6

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## QuickCheck 1.7

A ball is tossed straight up in the air. At its very highest point, the ball's acceleration vector  $\vec{a}$

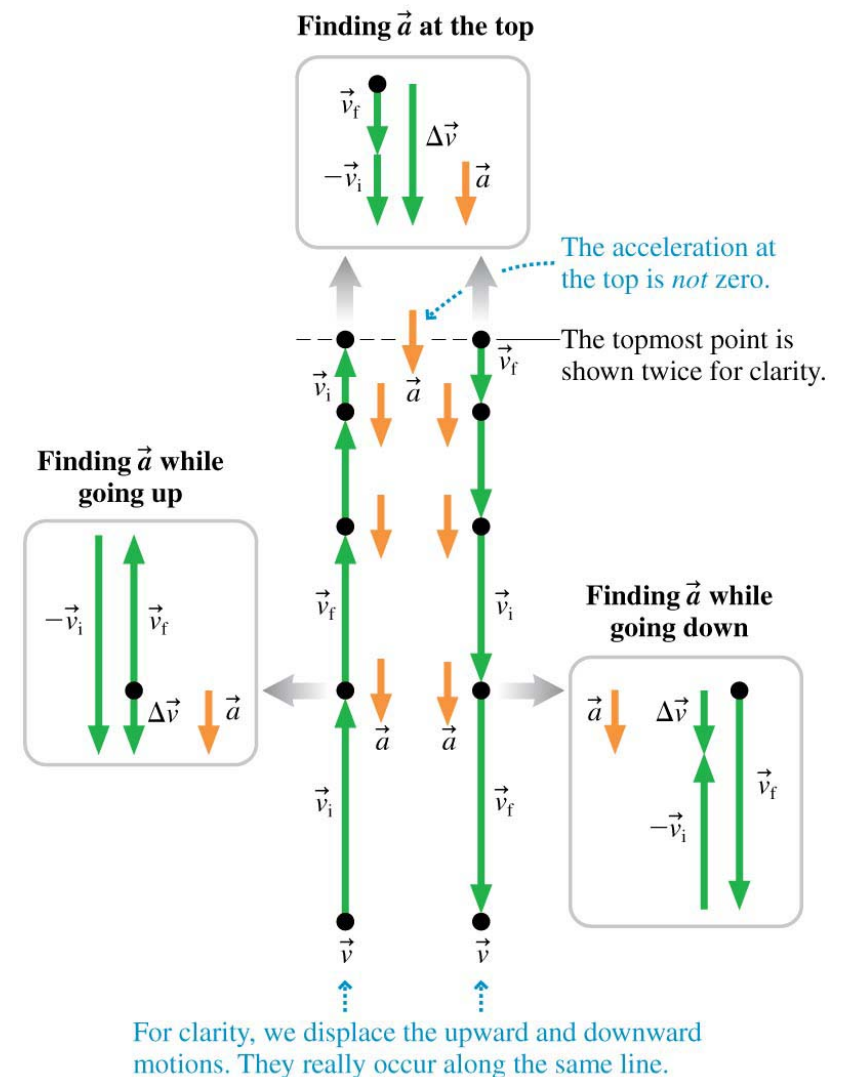
- A. Points up.
- B. Is zero.
- C. Points down.

# QuickCheck 1.7

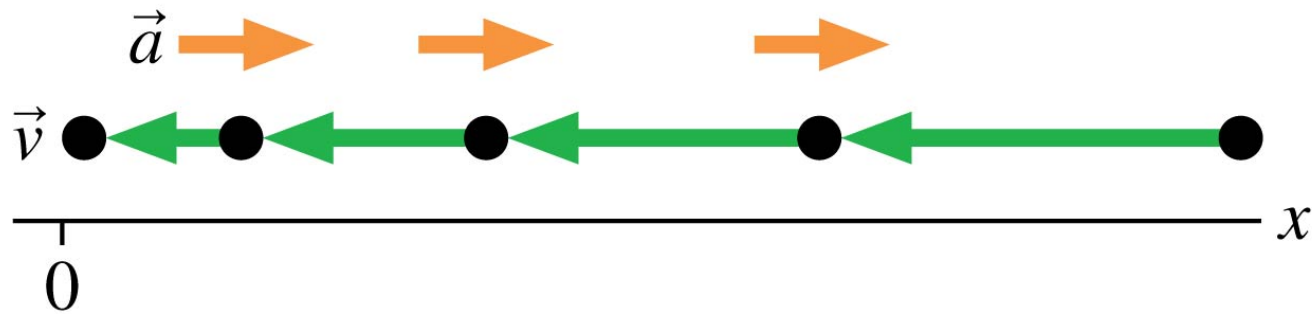
A ball is tossed straight up in the air. At its very highest point, the ball's acceleration vector  $\vec{a}$

- A. Points up.
- B. Is zero.
- ✓ C. Points down.

In fact, the acceleration vector points down as the ball rises, at the highest point, and as it falls.



## QuickCheck 1.8

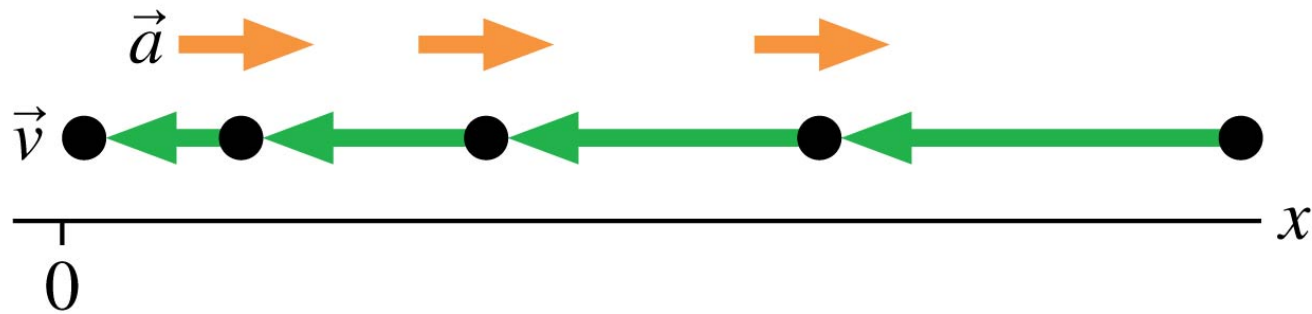


The motion diagram shows a particle that is slowing down. The sign of the position  $x$  and the sign of the velocity  $v_x$  are

- A. Position is positive, velocity is positive.
- B. Position is positive, velocity is negative.
- C. Position is negative, velocity is positive.
- D. Position is negative, velocity is negative.



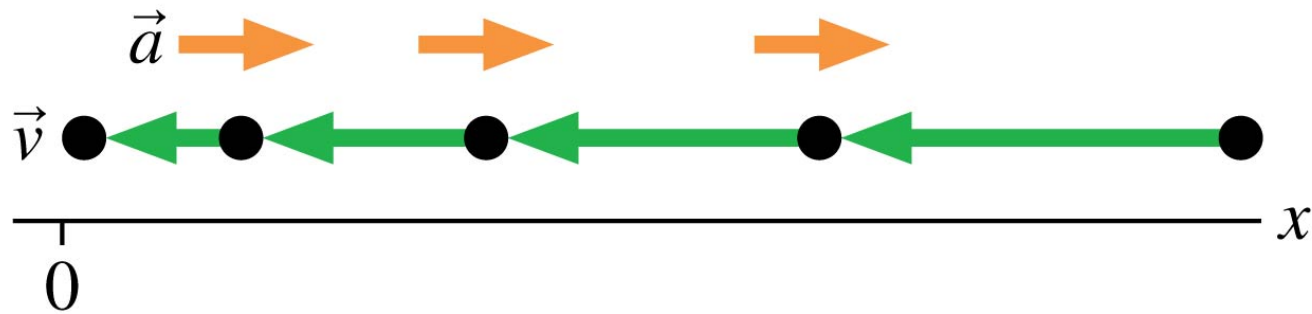
## QuickCheck 1.8



The motion diagram shows a particle that is slowing down. The sign of the position  $x$  and the sign of the velocity  $v_x$  are

- A. Position is positive, velocity is positive.
- ✓ **B. Position is positive, velocity is negative.**
- C. Position is negative, velocity is positive.
- D. Position is negative, velocity is negative.

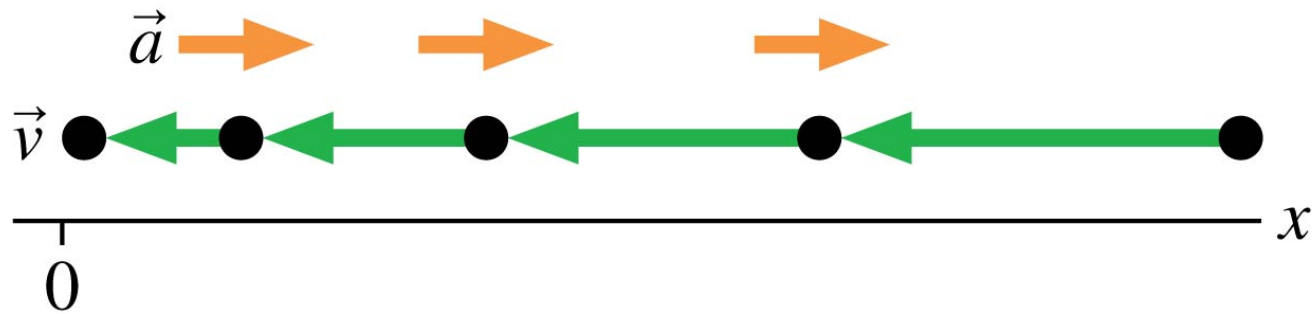
## QuickCheck 1.9



The motion diagram shows a particle that is slowing down. The sign of the acceleration  $a_x$  is

- A. Acceleration is positive.
- B. Acceleration is negative.

## QuickCheck 1.9



The motion diagram shows a particle that is slowing down. The sign of the acceleration  $a_x$  is

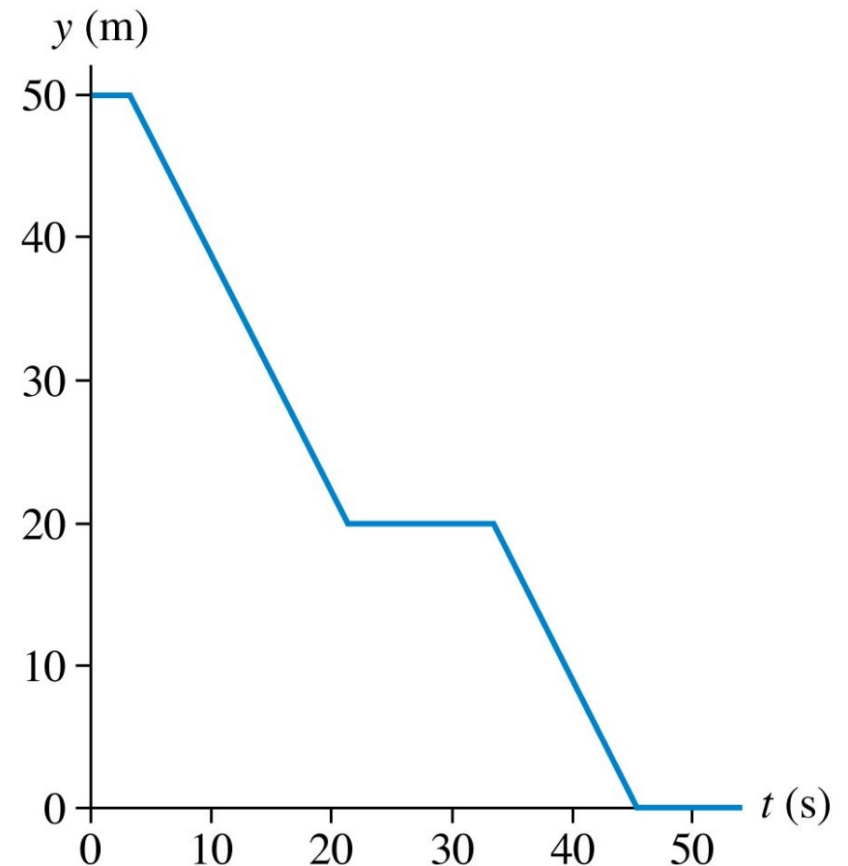
✓ **A. Acceleration is positive.**

B. Acceleration is negative.

## QuickCheck 1.10

This is a graph of an object moving along a straight line. The most likely interpretation is:

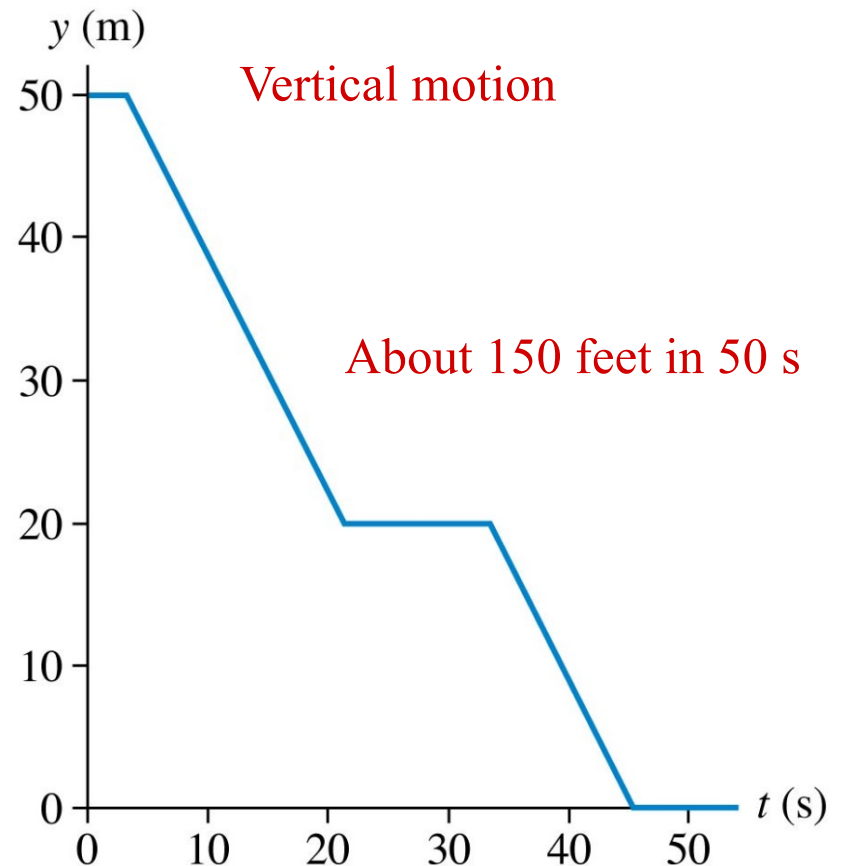
- A. A person walking down a steep mountain.
- B. A car that drives and stops and drives and stops.
- C. An elevator descending.
- D. A rock that falls, bounces, and falls some more.
- E. A ball that is hit, caught, and thrown to someone else.



# QuickCheck 1.10

This is a graph of an object moving along a straight line. The most likely interpretation is:

- A. A person walking down a steep mountain.
- B. A car that drives and stops and drives and stops.
- ✓ **C. An elevator descending.**
- D. A rock that falls, bounces, and falls some more.
- E. A ball that is hit, caught, and thrown to someone else.



# QuickCheck 1.11

Rank in order, from the most to the least, the number of significant figures in the following numbers. For example, if b has more than c, c has the same number as a, and a has more than d, you would give your answer as  $b > c = a > d$ .

a. 8200

b. 0.0052

c. 0.430

d.  $4.321 \times 10^{-10}$

A.  $d > c > b = a$

B.  $a = b = d > c$

C.  $b = d > c > a$

D.  $d > c > a > b$

E.  $a = d > c > b$

# QuickCheck 1.11

Rank in order, from the most to the least, the number of significant figures in the following numbers. For example, if b has more than c, c has the same number as a, and a has more than d, you would give your answer as  $b > c = a > d$ .

a. 8200

2? Ambiguous

b. 0.0052


2

c. 0.430

3

d.  $4.321 \times 10^{-10}$

4

 **A.  $d > c > b = a$**

B.  $a = b = d > c$

C.  $b = d > c > a$

D.  $d > c > a > b$

E.  $a = d > c > b$