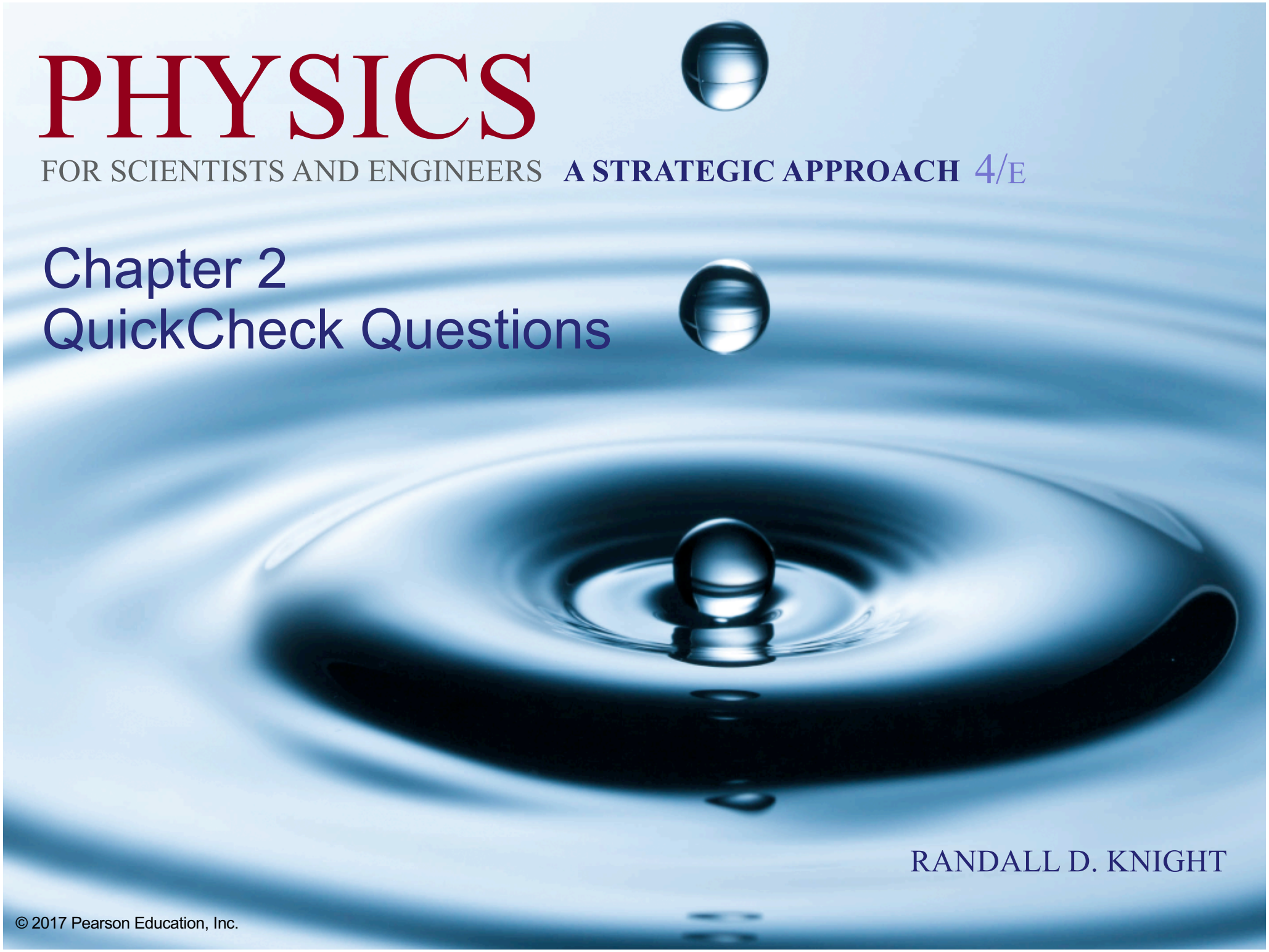
PHYSICS

FOR SCIENTISTS AND ENGINEERS **A STRATEGIC APPROACH** 4/E

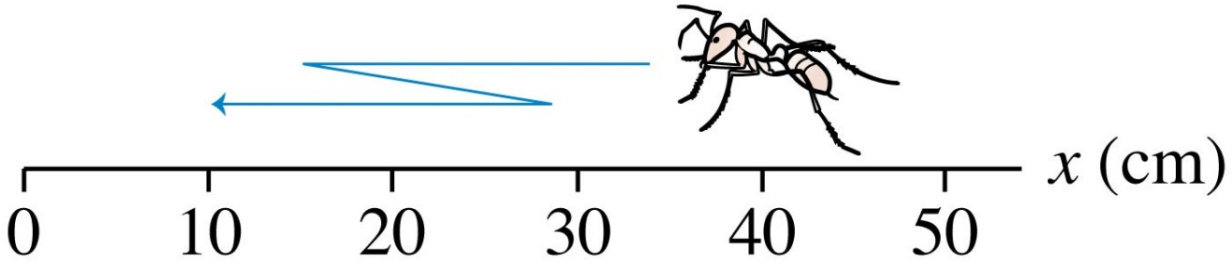
Chapter 2
QuickCheck Questions



RANDALL D. KNIGHT

QuickCheck 2.1

An ant zig-zags back and forth on a picnic table as shown.

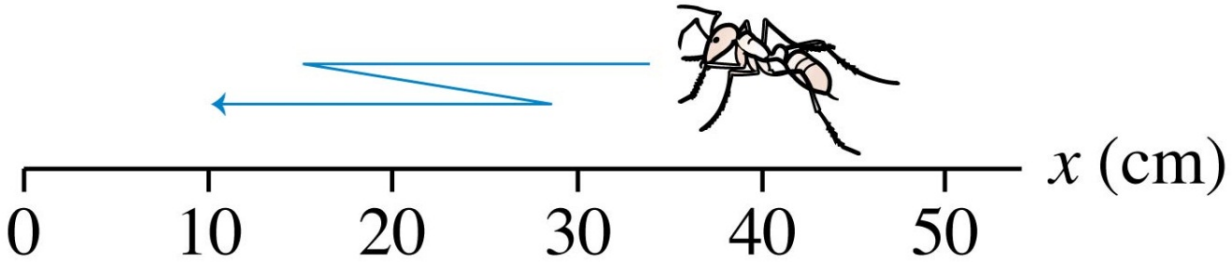


The ant's **distance traveled** and **displacement** are

A. 50 cm and 50 cm.
B. 30 cm and 50 cm.
C. 50 cm and 30 cm.
D. 50 cm and –50 cm.
E. 50 cm and –30 cm.

QuickCheck 2.1

An ant zig-zags back and forth on a picnic table as shown.



The ant's **distance traveled** and **displacement** are

A. 50 cm and 50 cm.
B. 30 cm and 50 cm.
C. 50 cm and 30 cm.
D. 50 cm and –50 cm.
✔ **E. 50 cm and –30 cm.**

QuickCheck 2.2

The slope at a point on a position-versus-time graph of an object is

A. The object's speed at that point.
B. The object's velocity at that point.
C. The object's acceleration at that point.
D. The distance traveled by the object to that point.
E. I really have no idea.

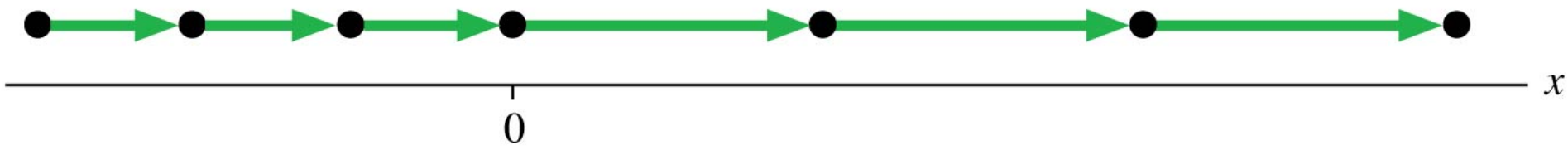
QuickCheck 2.2

The slope at a point on a position-versus-time graph of an object is

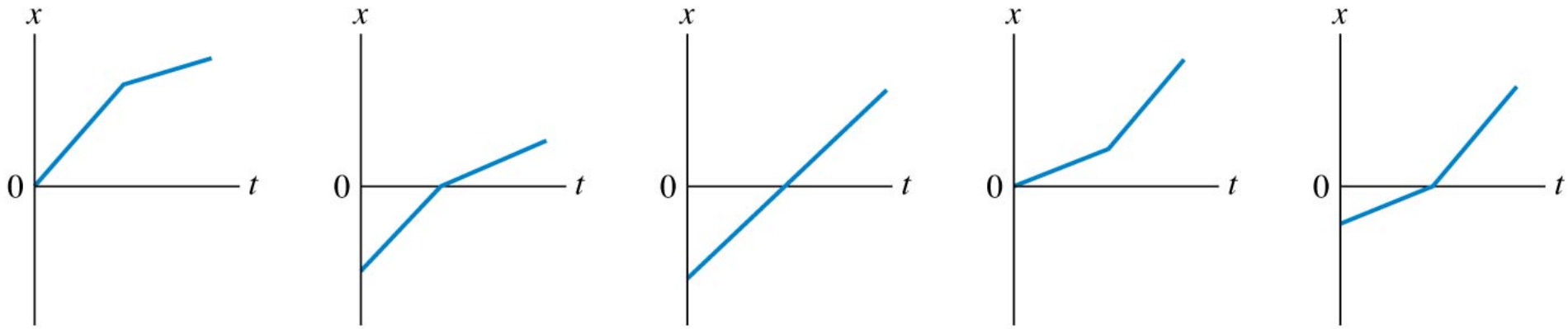
A. The object's speed at that point.
✔ **B. The object's velocity at that point.**
C. The object's acceleration at that point.
D. The distance traveled by the object to that point.
E. I really have no idea.

QuickCheck 2.3

Here is a motion diagram of a car moving along a straight road:



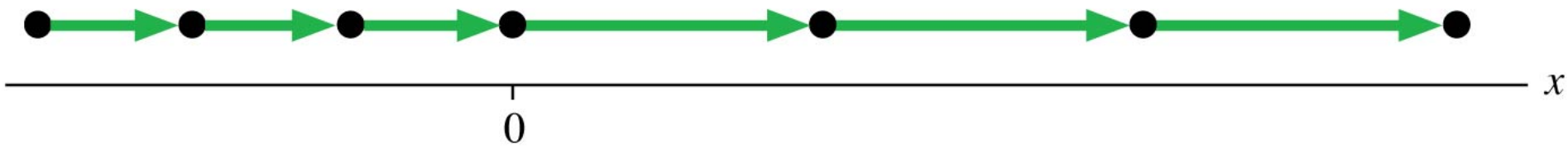
Which position-versus-time graph matches this motion diagram?



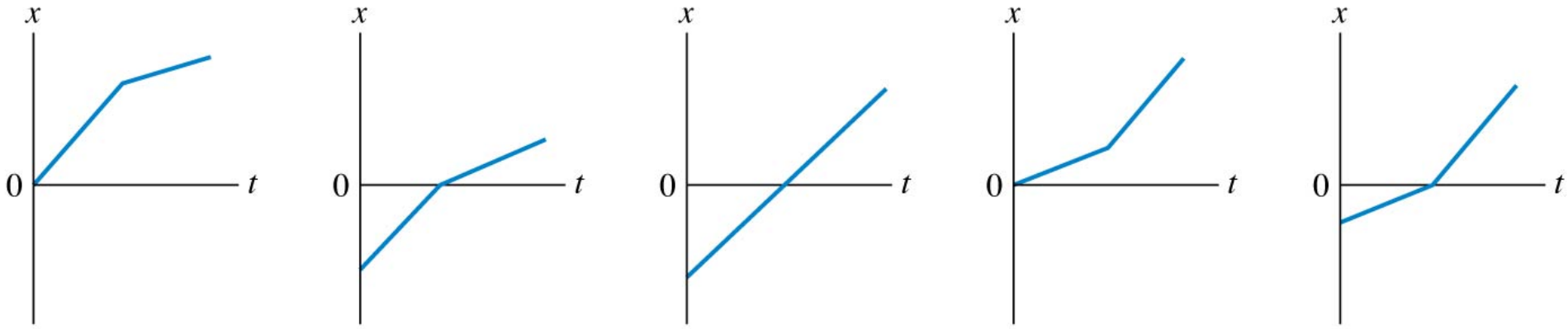
A. B. C. D. E.

QuickCheck 2.3

Here is a motion diagram of a car moving along a straight road:

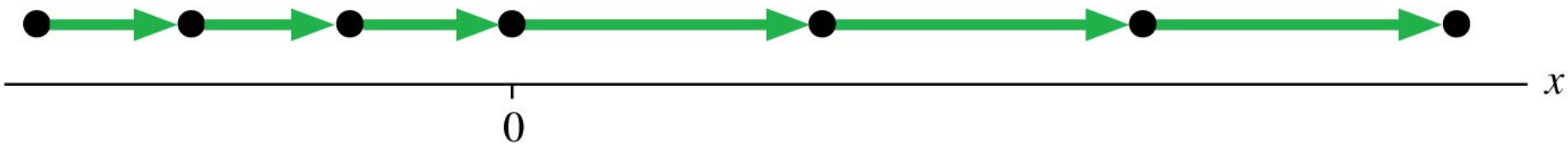


Which position-versus-time graph matches this motion diagram?

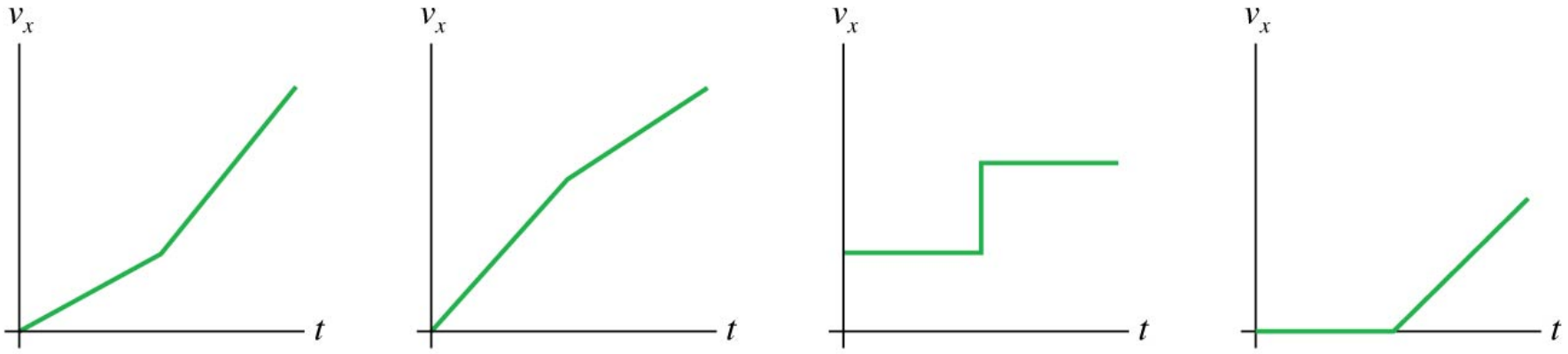


QuickCheck 2.4

Here is a motion diagram of a car moving along a straight road:



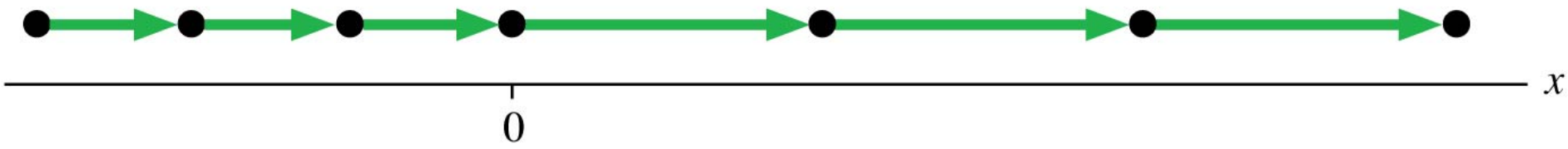
Which velocity-versus-time graph matches this motion diagram?



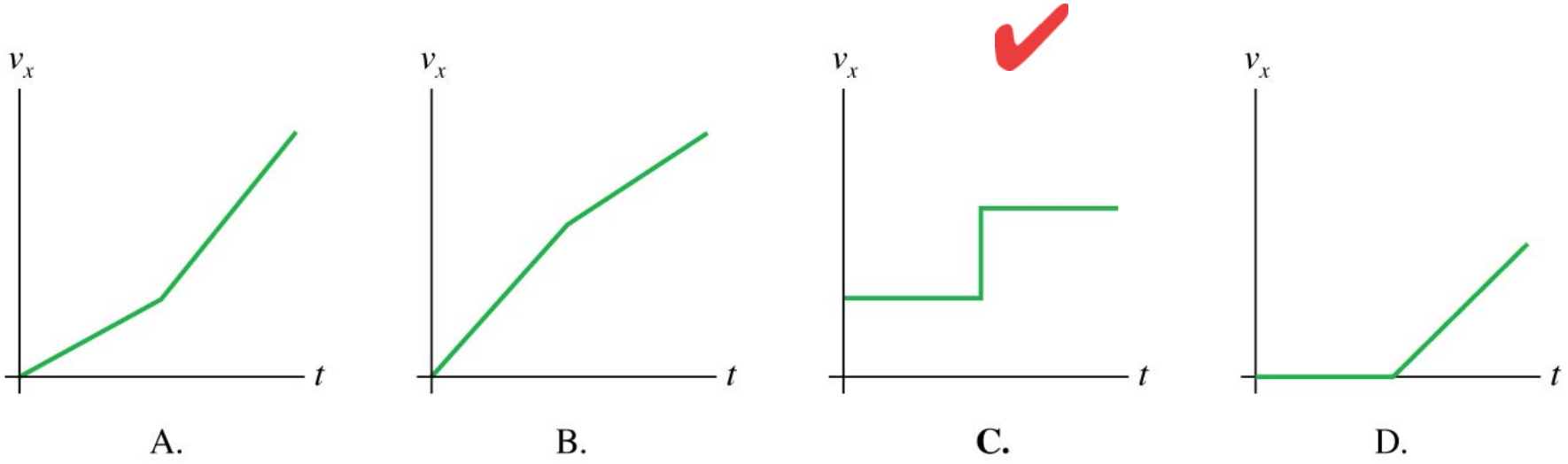
E. None of the above.

QuickCheck 2.4

Here is a motion diagram of a car moving along a straight road:



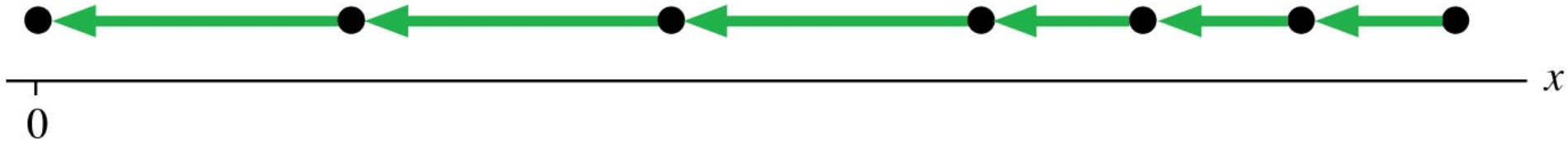
Which velocity-versus-time graph matches this motion diagram?



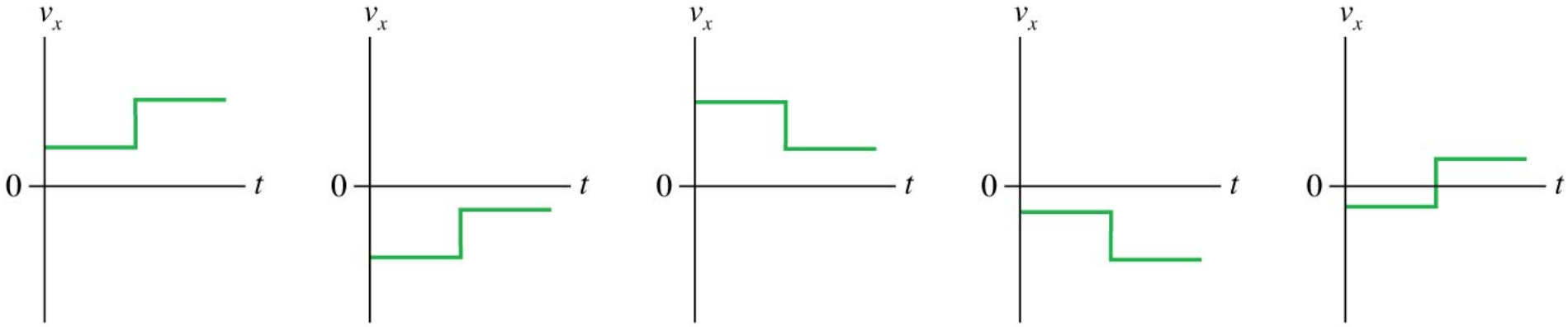
E. None of the above.

QuickCheck 2.5

Here is a motion diagram of a car moving along a straight road:

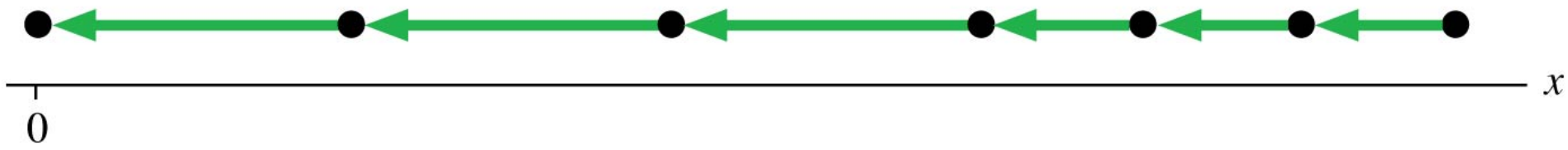


Which velocity-versus-time graph matches this motion diagram?

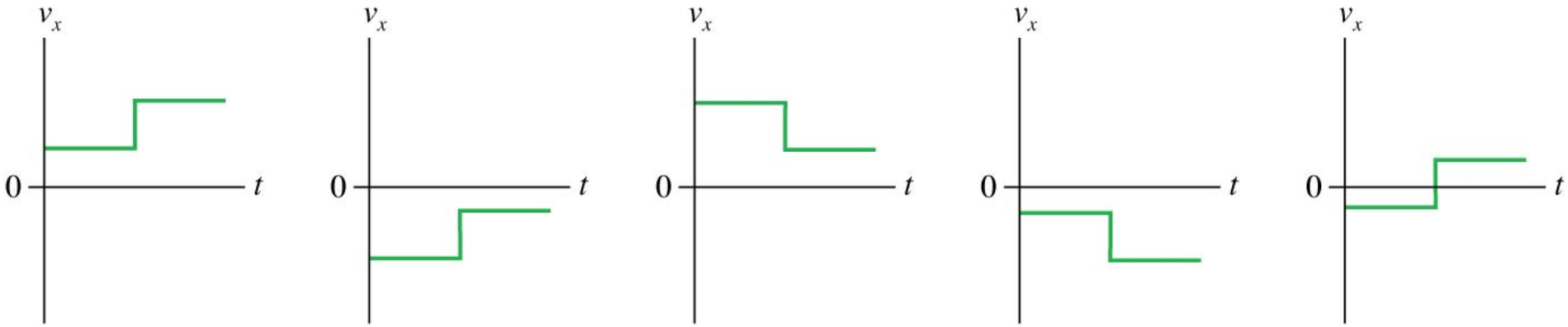


QuickCheck 2.5

Here is a motion diagram of a car moving along a straight road:

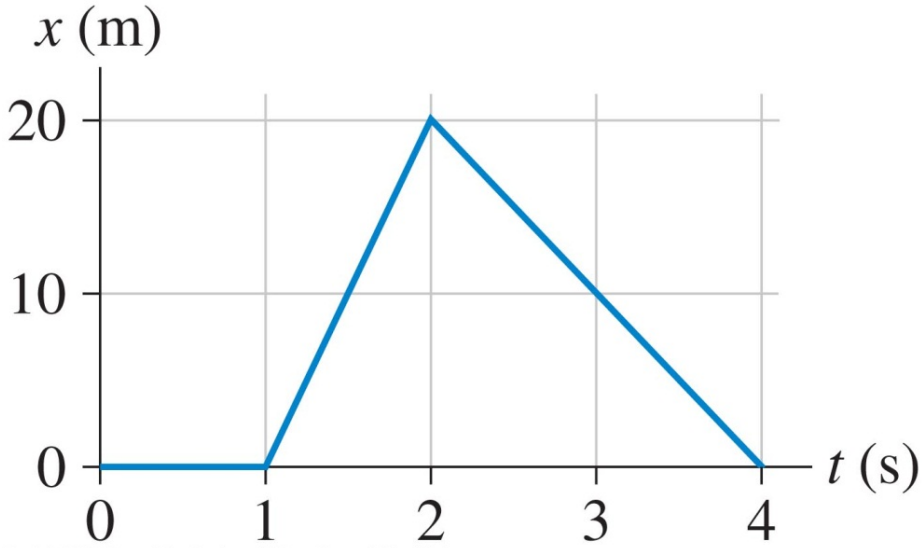


Which velocity-versus-time graph matches this motion diagram?



QuickCheck 2.6

Here is a position graph of an object:

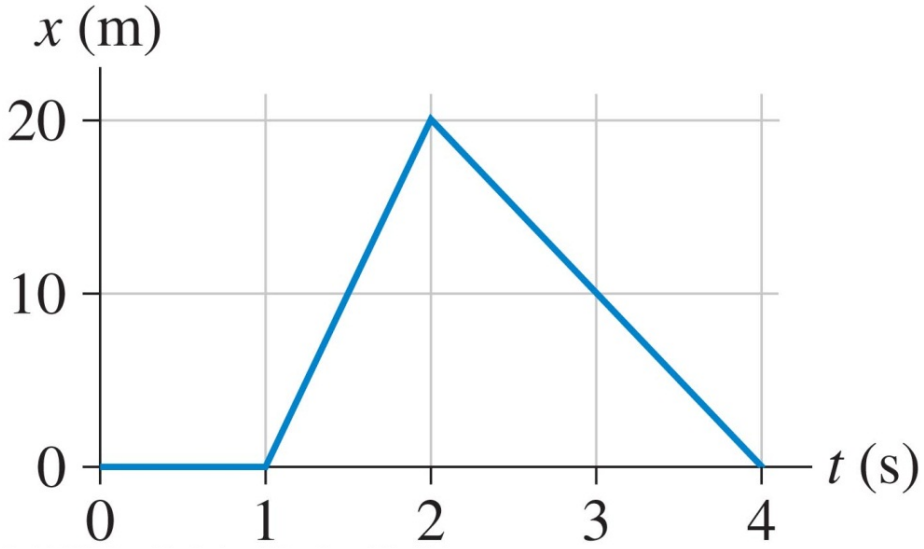


At $t = 1.5$ s, the object's velocity is

A. 40 m/s
B. 20 m/s
C. 10 m/s
D. –10 m/s
E. None of the above.

QuickCheck 2.6

Here is a position graph of an object:



At $t = 1.5$ s, the object's velocity is

A. 40 m/s

✔ **B. 20 m/s**

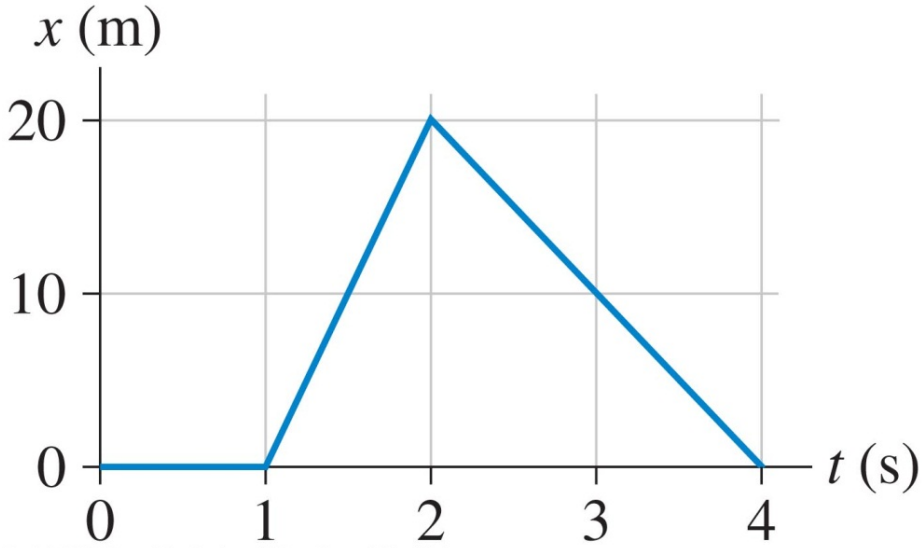
C. 10 m/s

D. –10 m/s

E. None of the above.

QuickCheck 2.7

Here is a position graph of an object:

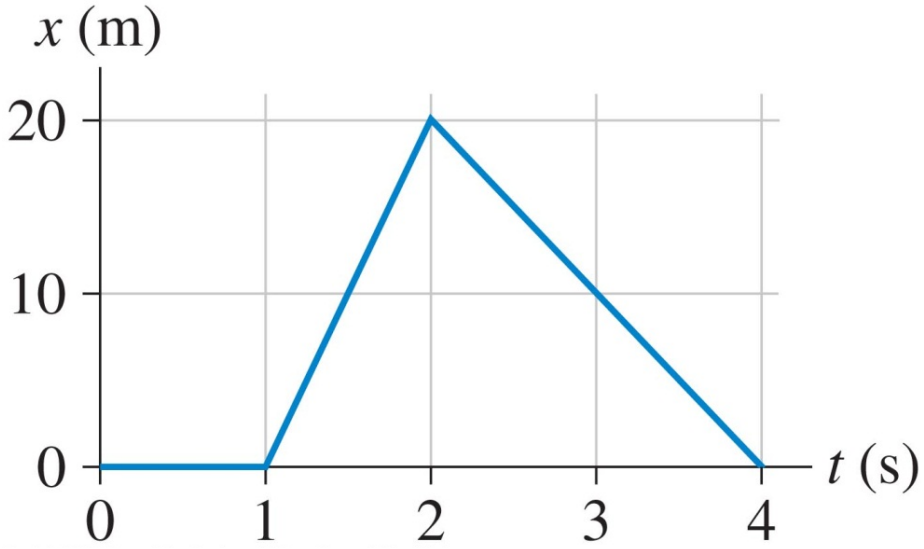


At $t = 3.0$ s, the object's velocity is

A. 40 m/s
B. 20 m/s
C. 10 m/s
D. –10 m/s
E. None of the above.

QuickCheck 2.7

Here is a position graph of an object:

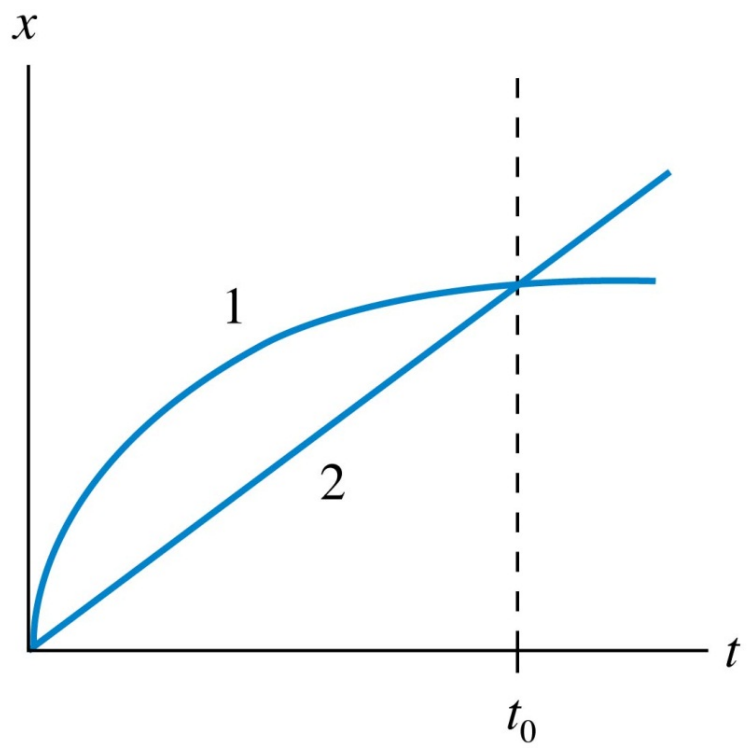


At $t = 3.0$ s, the object's velocity is

A. 40 m/s
B. 20 m/s
C. 10 m/s
✔ **D. –10 m/s**
E. None of the above.

QuickCheck 2.8

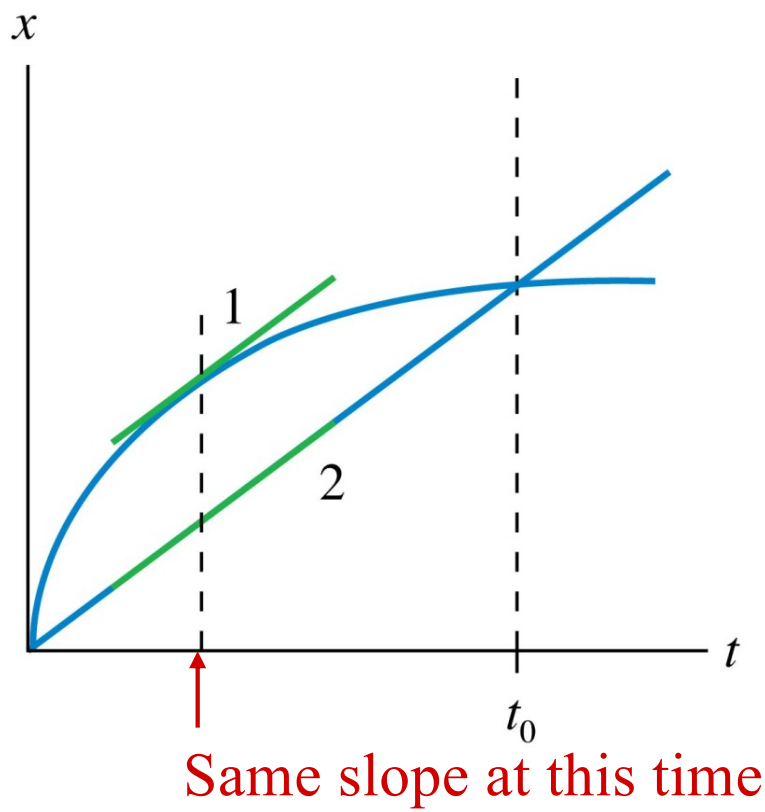
When do objects 1 and 2 have the same velocity?



A. At some instant before time t_0.
B. At time t_0.
C. At some instant after time t_0.
D. Both A and B.
E. Never.

QuickCheck 2.8

When do objects 1 and 2 have the same velocity?



✔ **A. At some instant before time t_0.**

B. At time t_0.

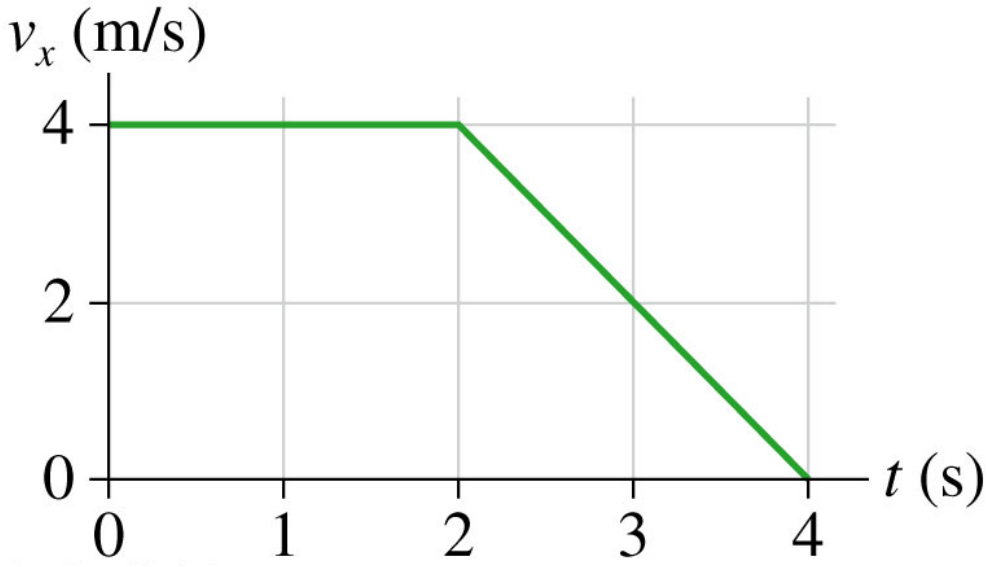
C. At some instant after time t_0.

D. Both A and B.

E. Never.

QuickCheck 2.9

Here is the velocity graph of an object that is at the origin ($x = 0$ m) at $t = 0$ s.

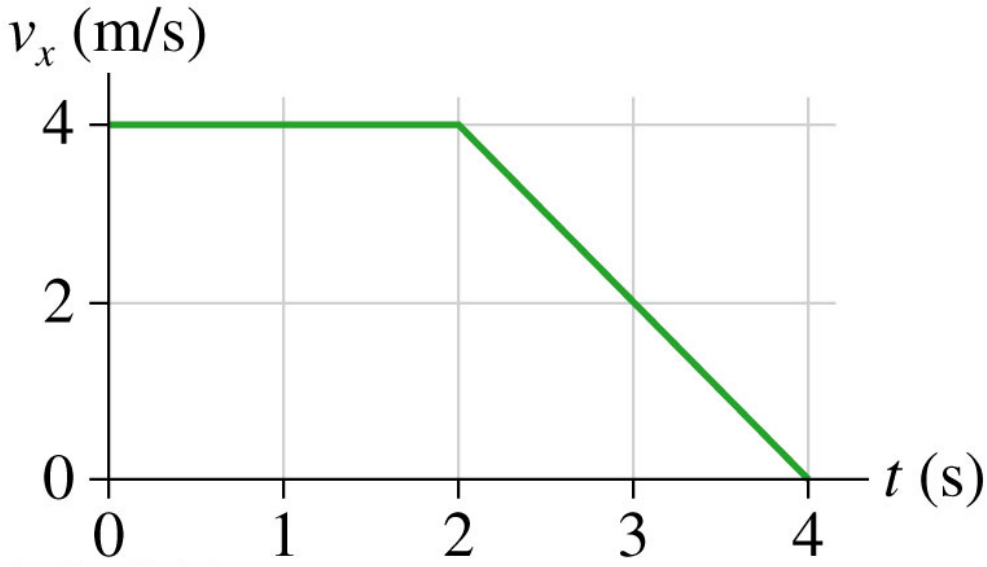


At $t = 4.0$ s, the object's position is

A. 20 m.
B. 16 m.
C. 12 m.
D. 8 m.
E. 4 m.

QuickCheck 2.9

Here is the velocity graph of an object that is at the origin ($x = 0$ m) at $t = 0$ s.



At $t = 4.0$ s, the object's position is

A. 20 m.

B. 16 m.

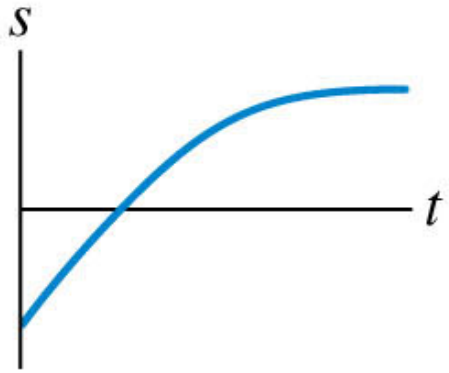
✔ **C. 12 m.** Displacement = area under the curve

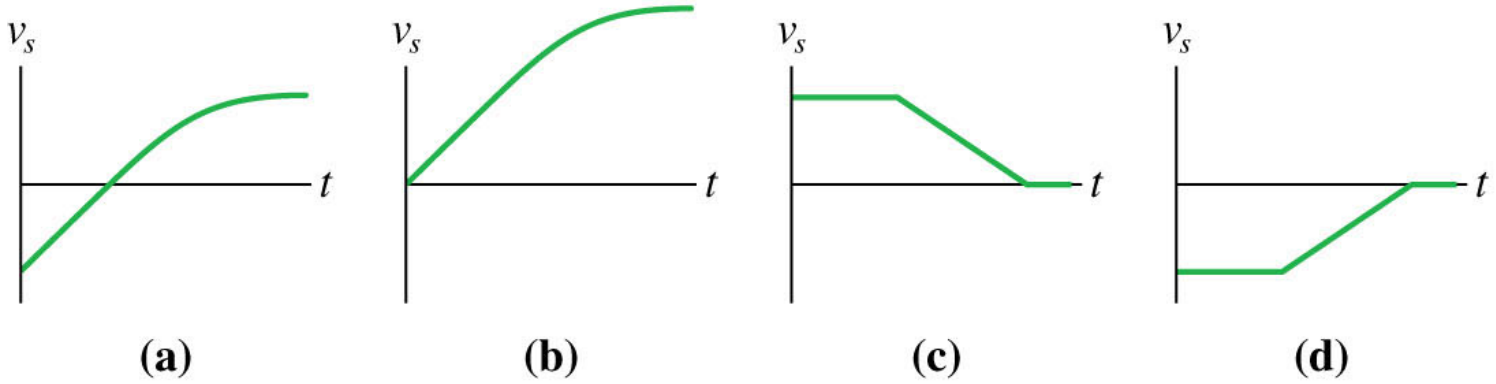
D. 8 m.

E. 4 m.

QuickCheck 2.10

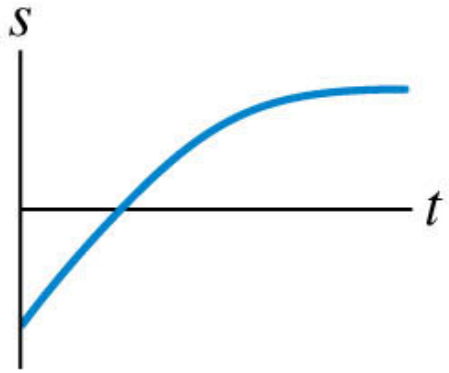
Which velocity-versus-time graph goes with this position graph?

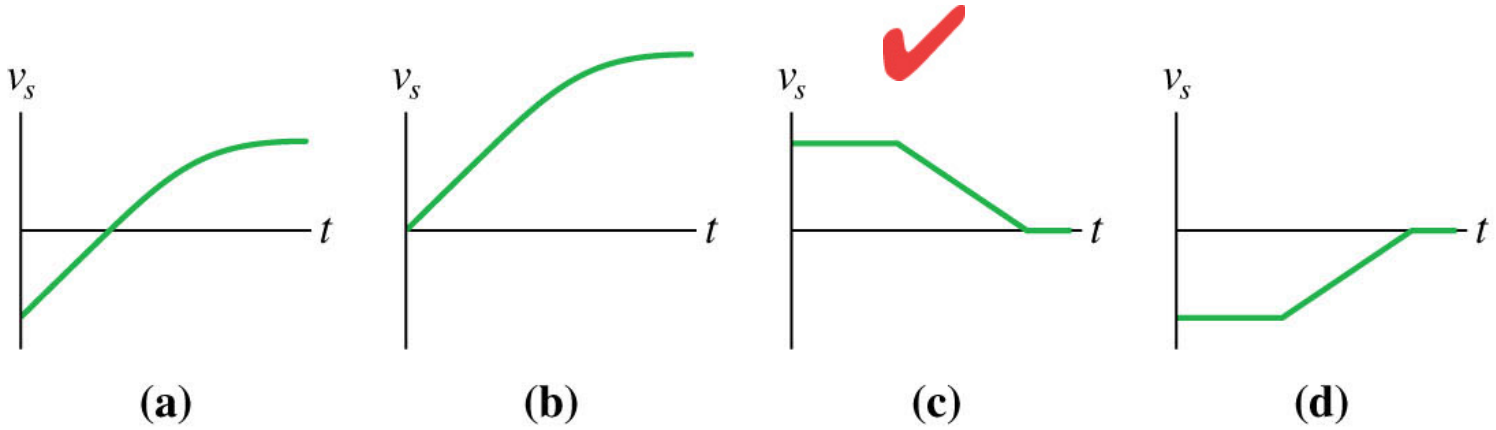




QuickCheck 2.10

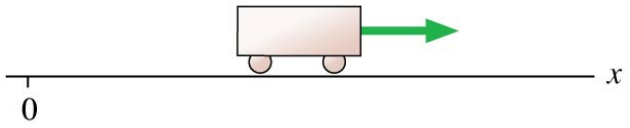
Which velocity-versus-time graph goes with this position graph?



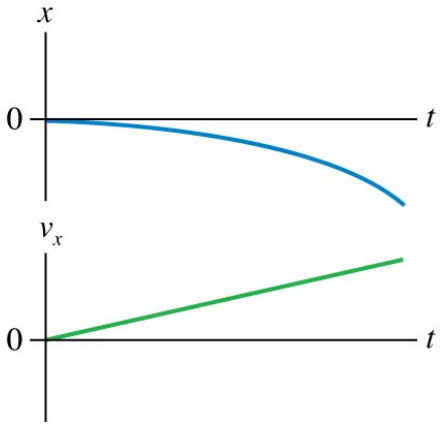


QuickCheck 2.11

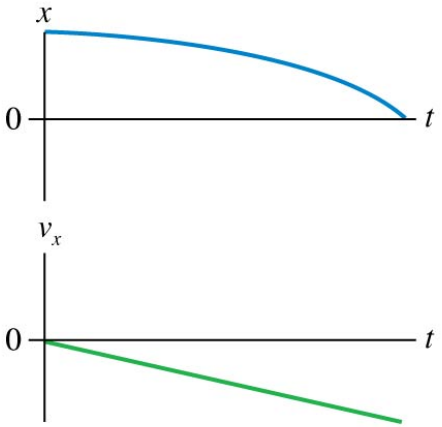
A cart slows down while moving away from the origin. What do the position and velocity graphs look like?



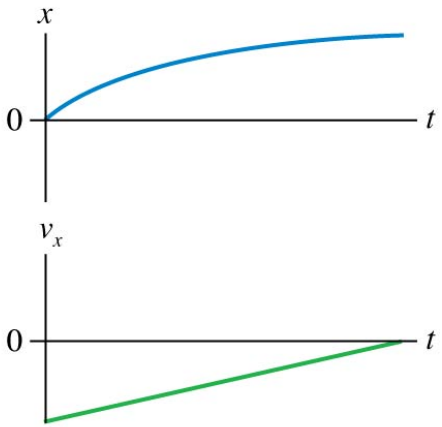
A.



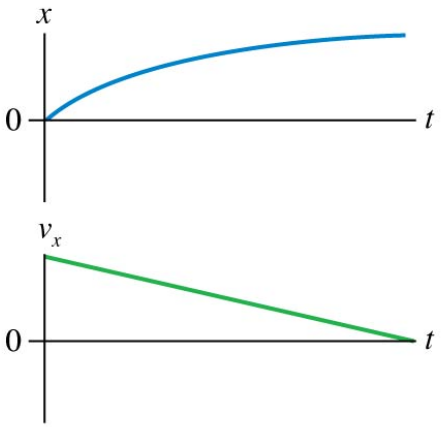
C.



B.

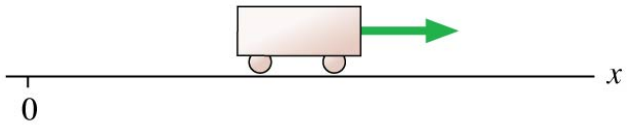


D.

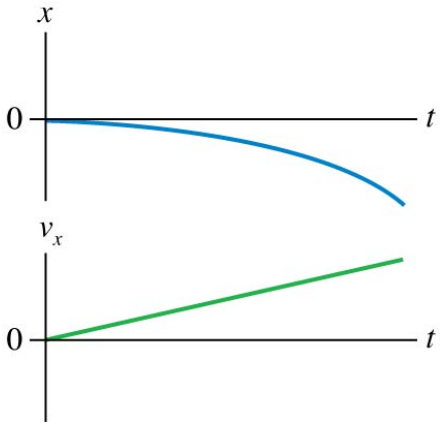


QuickCheck 2.11

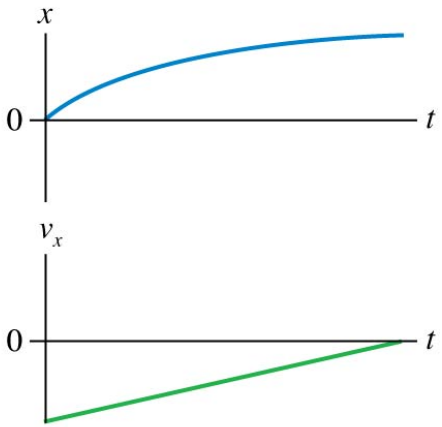
A cart slows down while moving away from the origin. What do the position and velocity graphs look like?



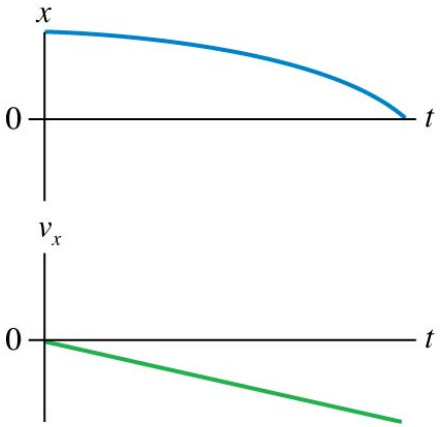
A.



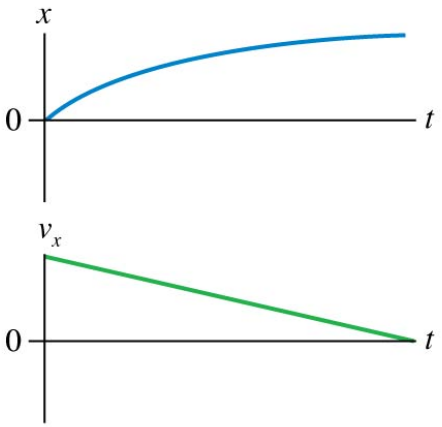
B.



C.

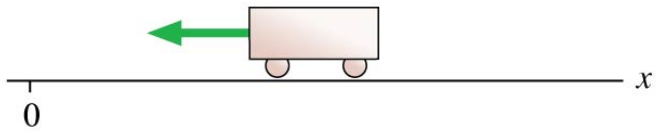


D.

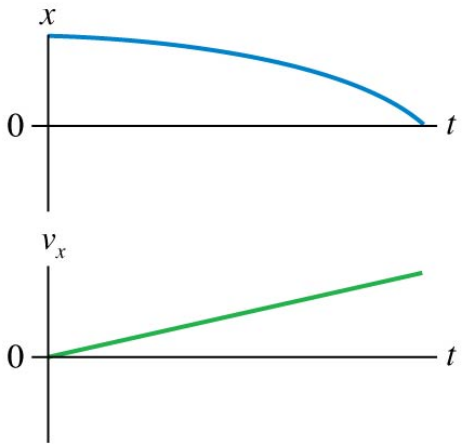


QuickCheck 2.12

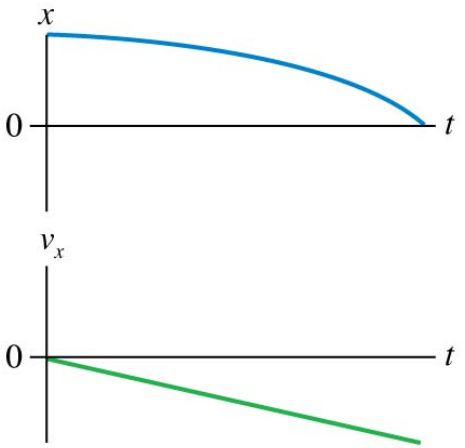
A cart speeds up toward the origin. What do the position and velocity graphs look like?



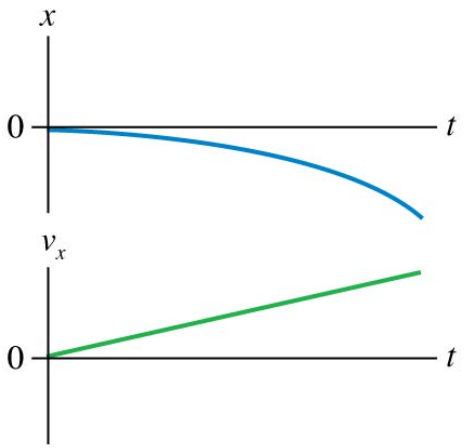
A.



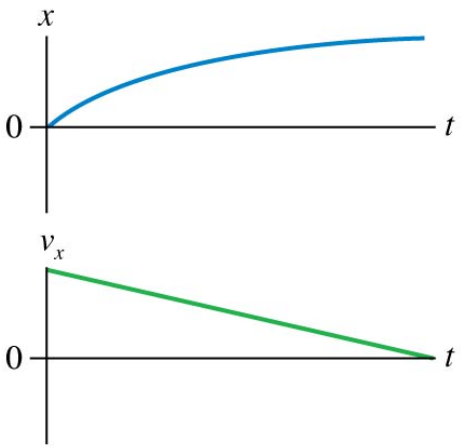
C.



B.

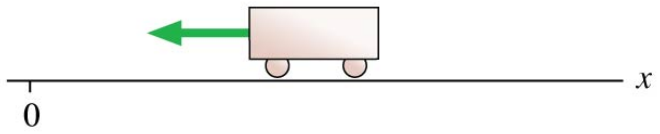


D.

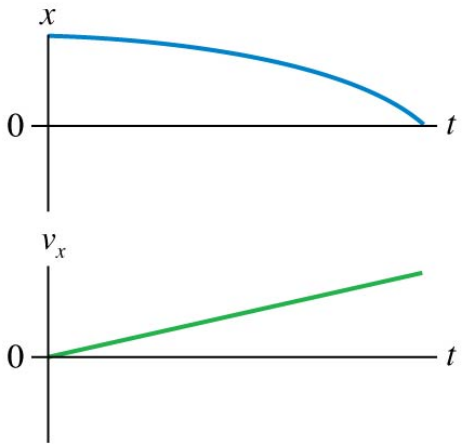


QuickCheck 2.12

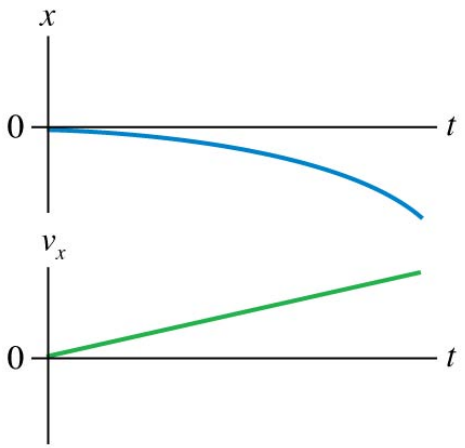
A cart speeds up toward the origin. What do the position and velocity graphs look like?



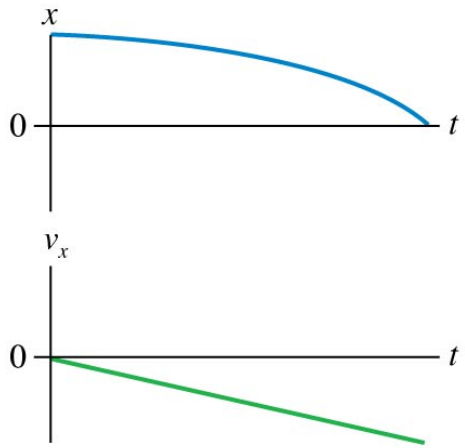
A.



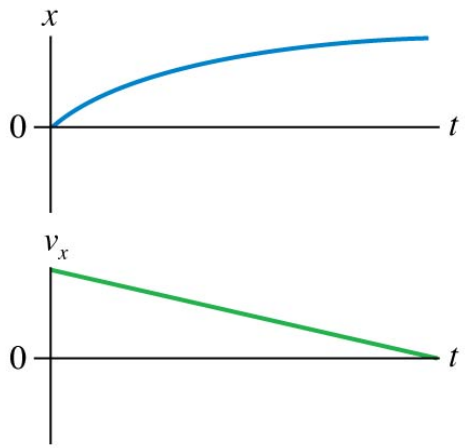
B.



C.

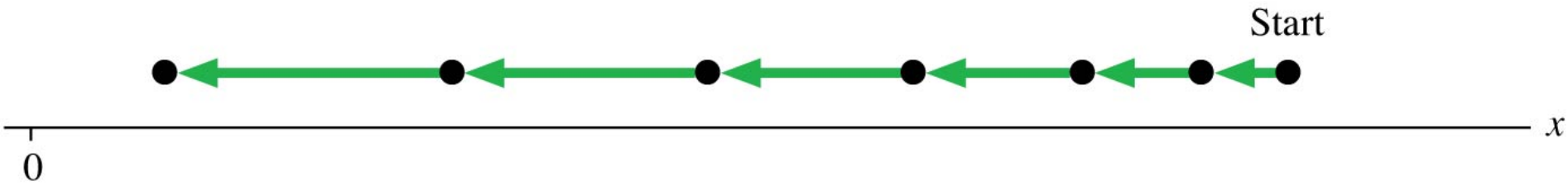


D.



QuickCheck 2.13

Here is a motion diagram of a car speeding up on a straight road:

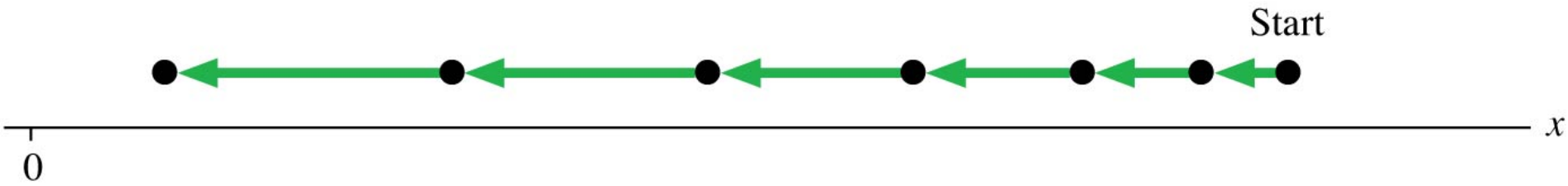


The sign of the acceleration a_x is

A. Positive.
B. Negative.
C. Zero.

QuickCheck 2.13

Here is a motion diagram of a car speeding up on a straight road:



The sign of the acceleration a_x is

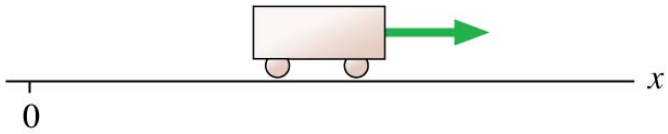
A. Positive.

✔ **B. Negative.** Speeding up means v_x and a_x have the same sign.

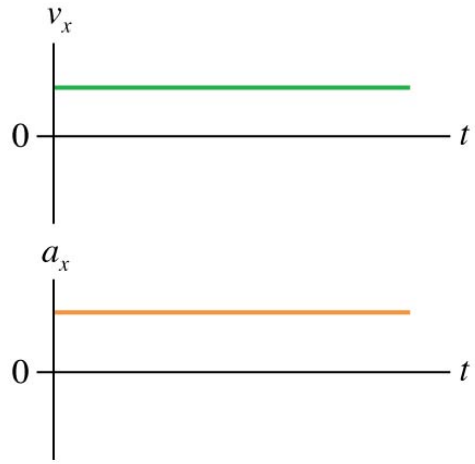
C. Zero.

QuickCheck 2.14

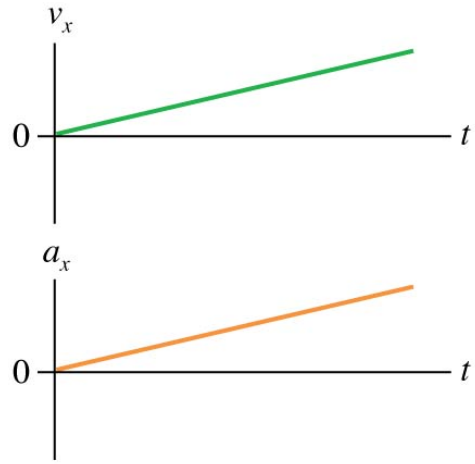
A cart *speeds up* while moving away from the origin. What do the velocity and acceleration graphs look like?



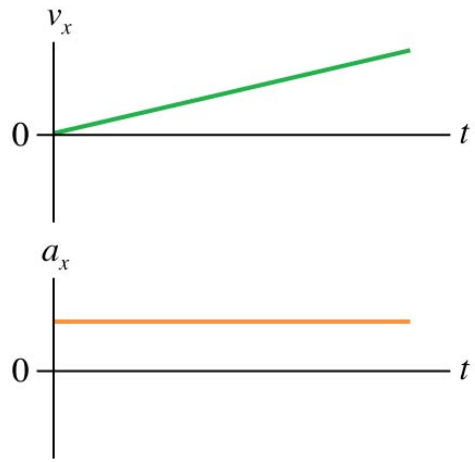
A.



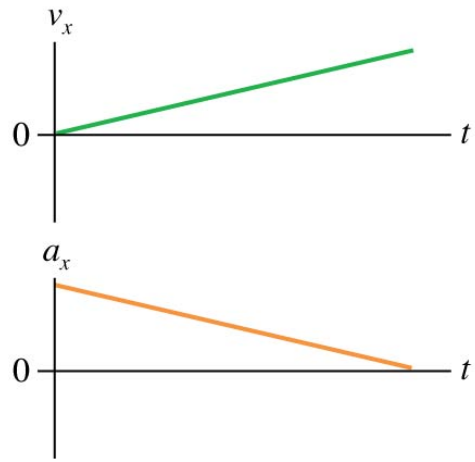
C.



B.

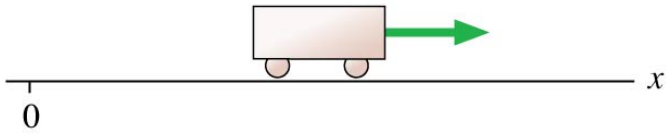


D.

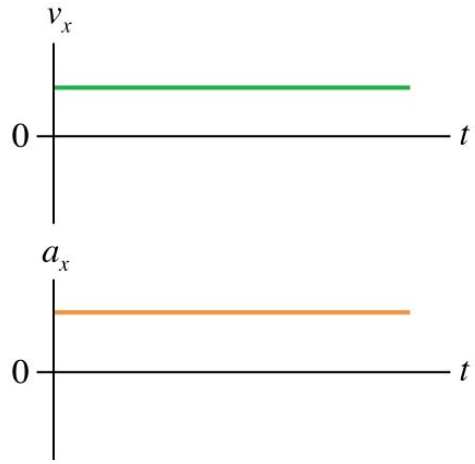


QuickCheck 2.14

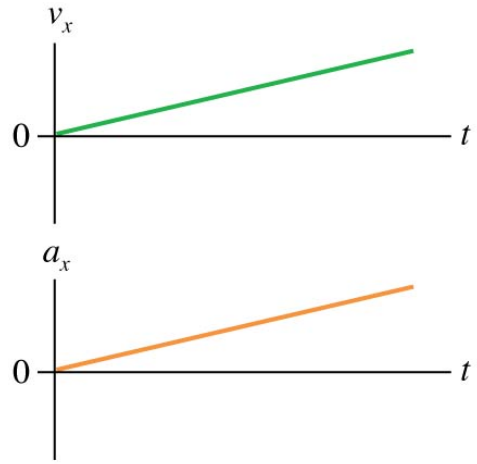
A cart *speeds up* while moving away from the origin. What do the velocity and acceleration graphs look like?



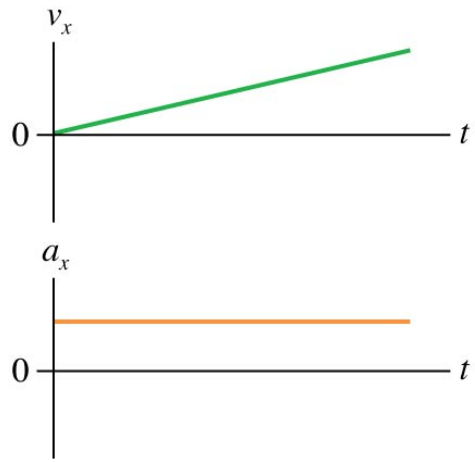
A.



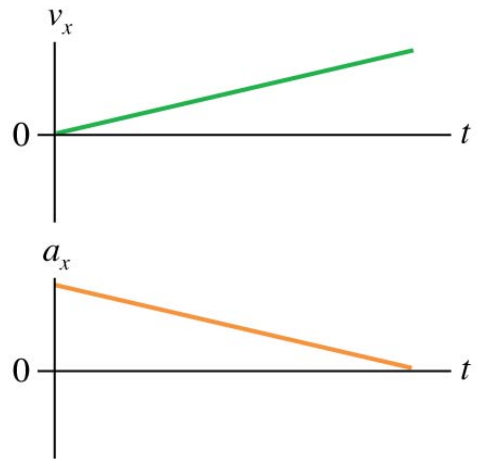
C.



B.

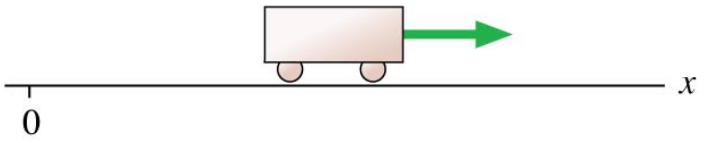


D.

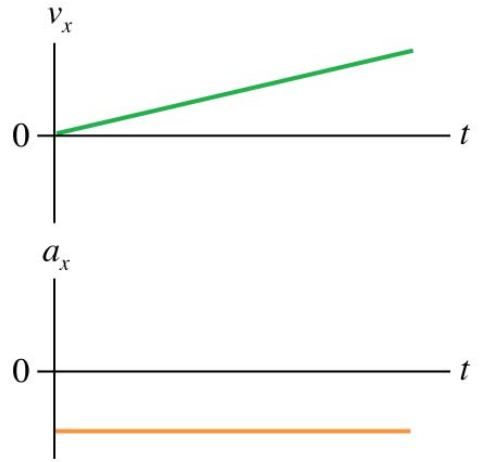


QuickCheck 2.15

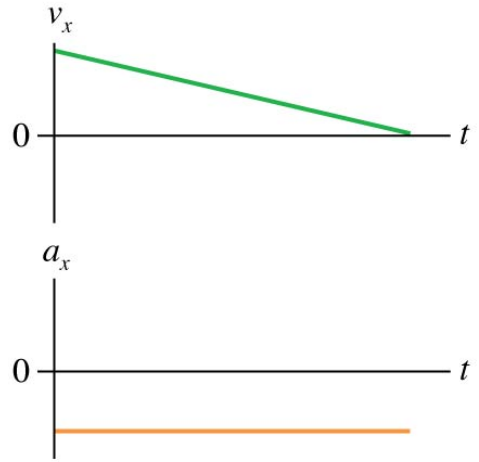
A cart *slows down* while moving away from the origin. What do the velocity and acceleration graphs look like?



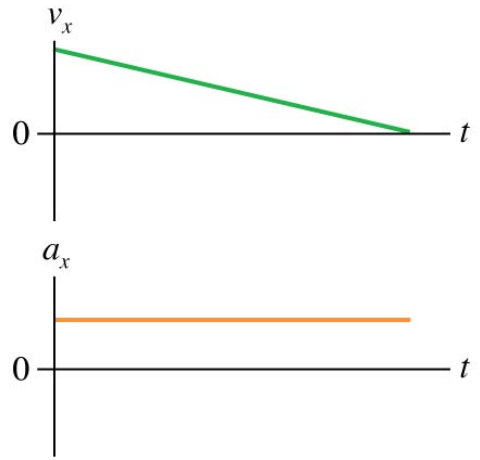
A.



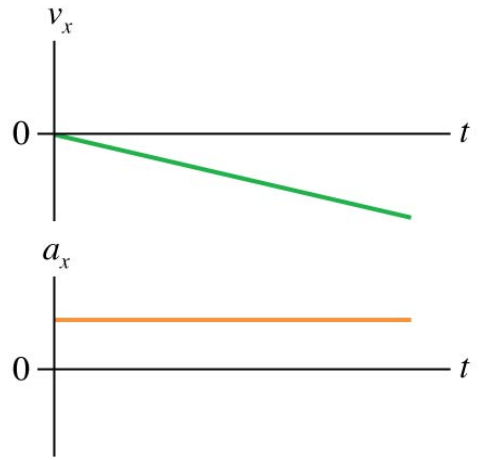
C.



B.

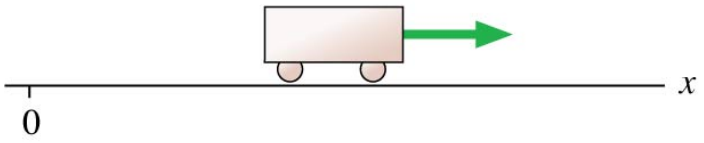


D.

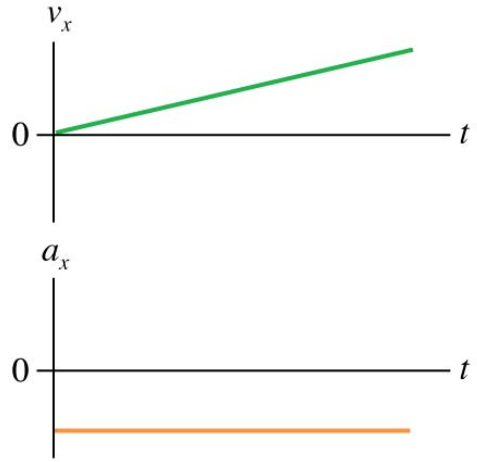


QuickCheck 2.15

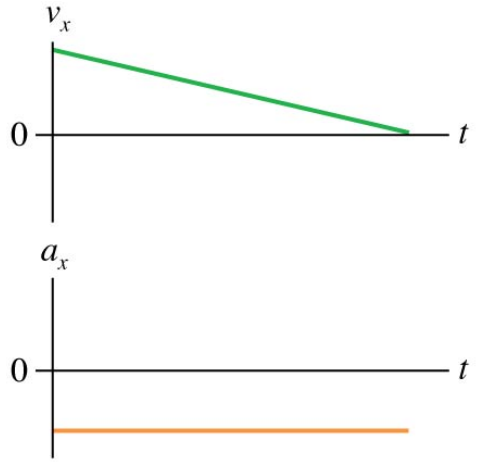
A cart *slows down* while moving away from the origin. What do the velocity and acceleration graphs look like?



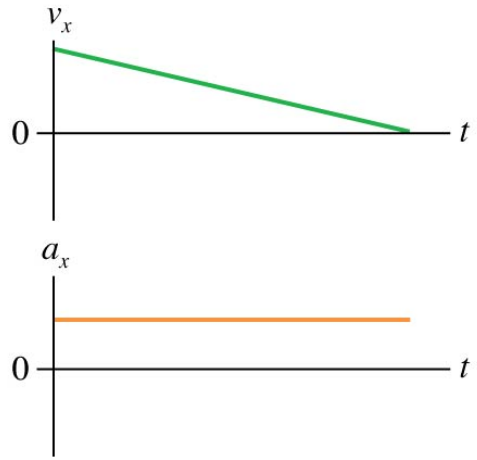
A.



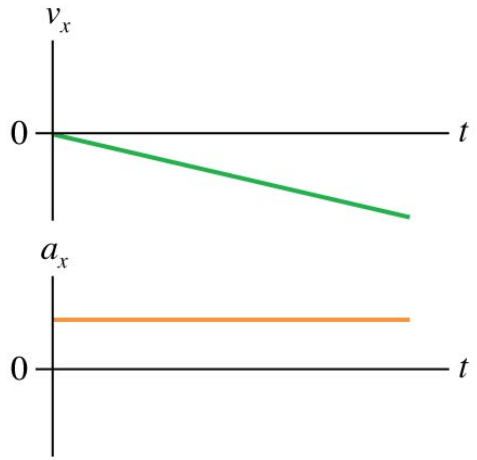
C.



B.

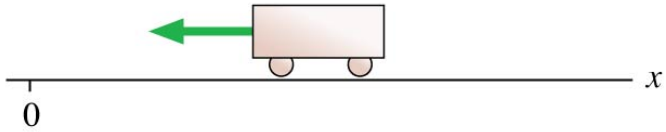


D.

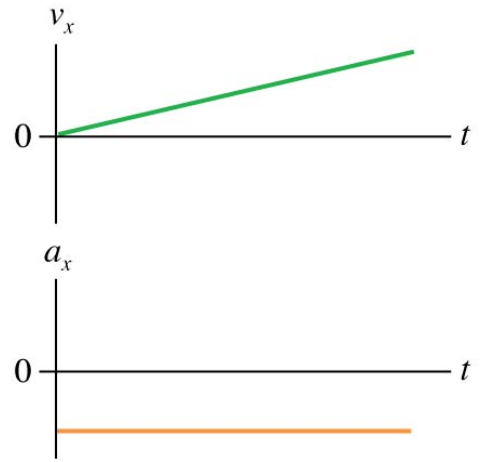


QuickCheck 2.16

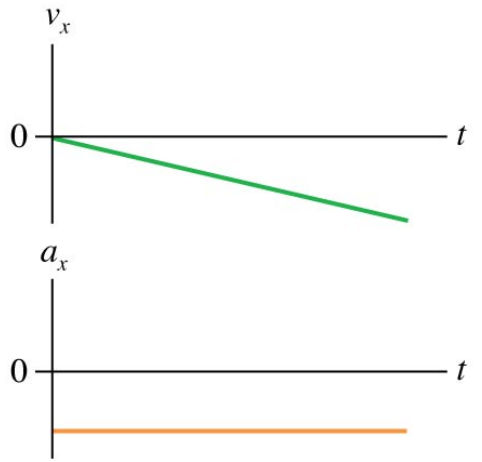
A cart *speeds up* while moving toward the origin. What do the velocity and acceleration graphs look like?



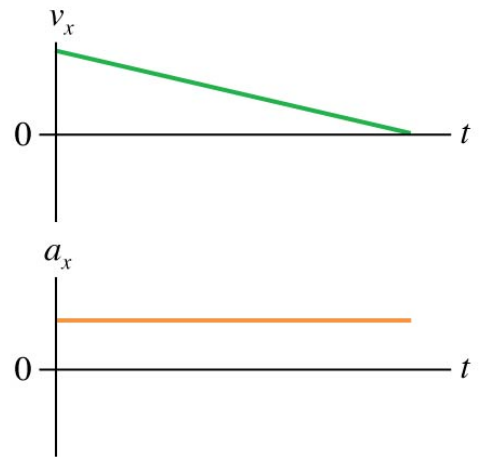
A.



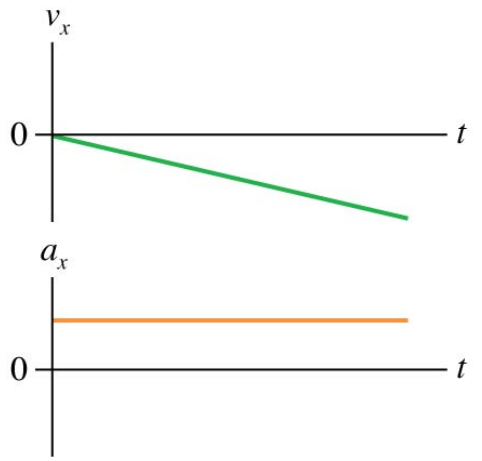
C.



B.

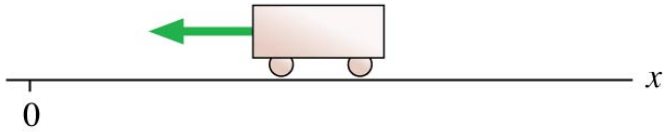


D.

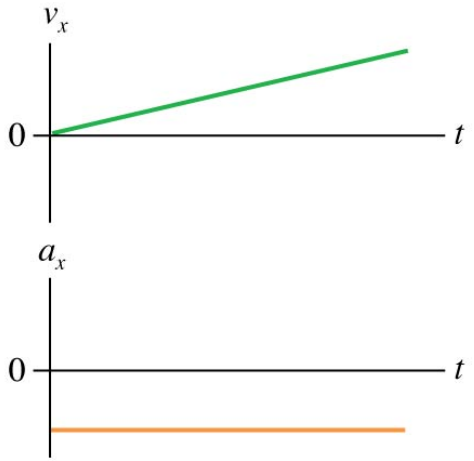


QuickCheck 2.16

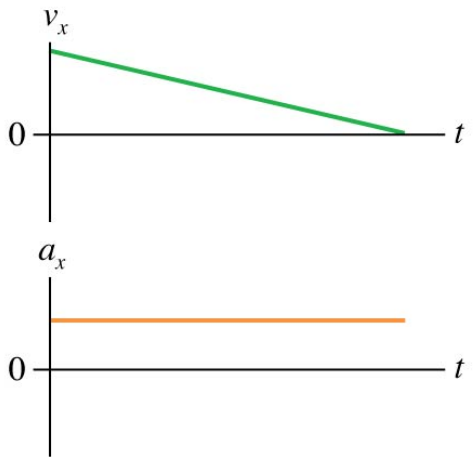
A cart *speeds up* while moving toward the origin. What do the velocity and acceleration graphs look like?



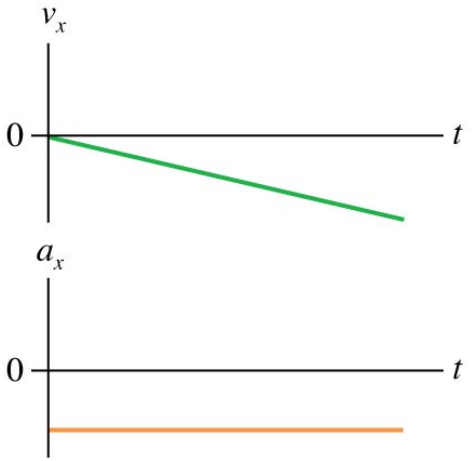
A.



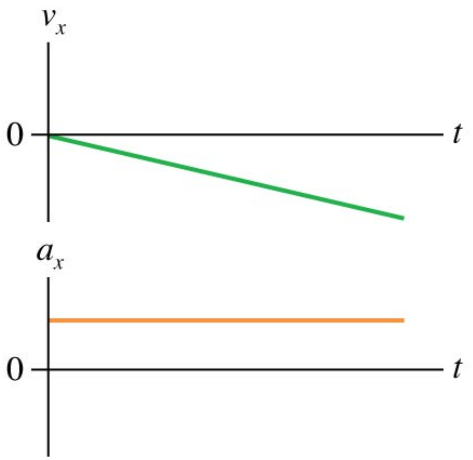
B.



C.

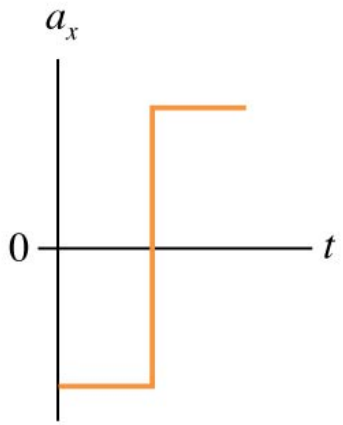


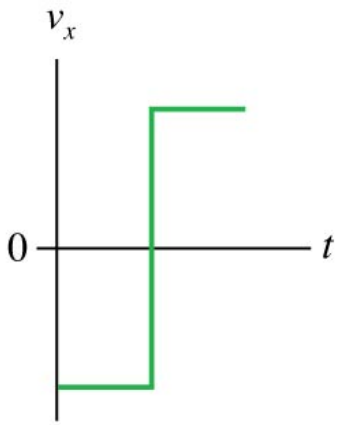
D.



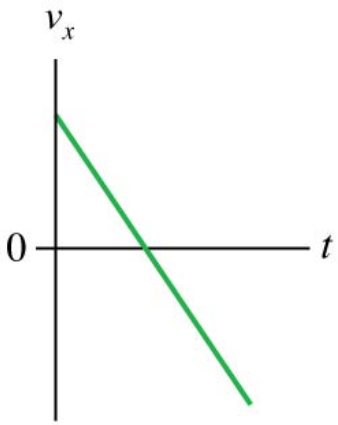
QuickCheck 2.17

Which velocity-versus-time graph goes with this acceleration graph?

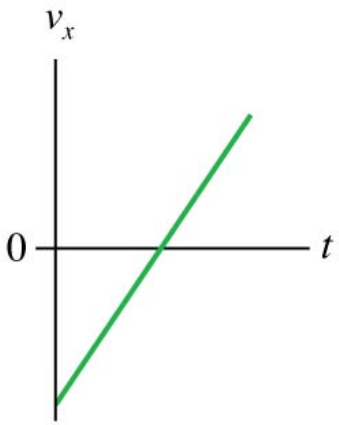




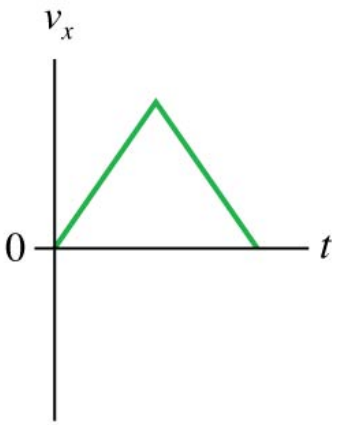
A.



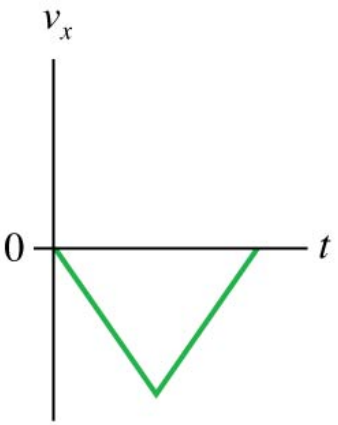
B.



C.



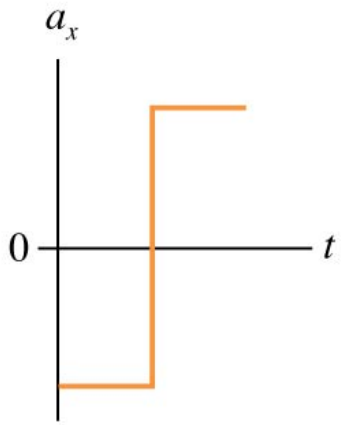
D.

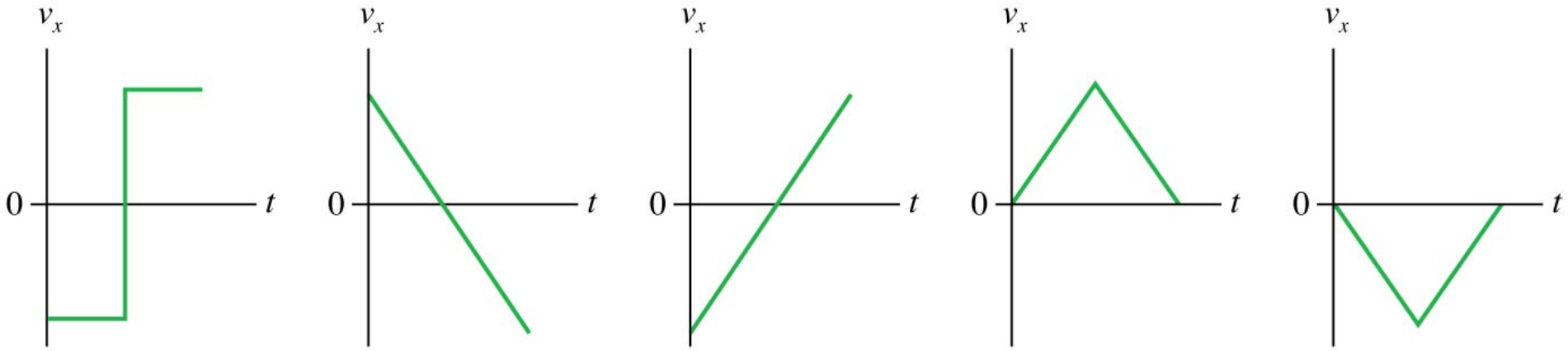


E.

QuickCheck 2.17

Which velocity-versus-time graph goes with this acceleration graph?





QuickCheck 2.18

A ball is tossed straight up in the air. At its very highest point, the ball's instantaneous acceleration a_y is

A. Positive.
B. Negative.
C. Zero.

QuickCheck 2.18

A ball is tossed straight up in the air. At its very highest point, the ball's instantaneous acceleration a_y is

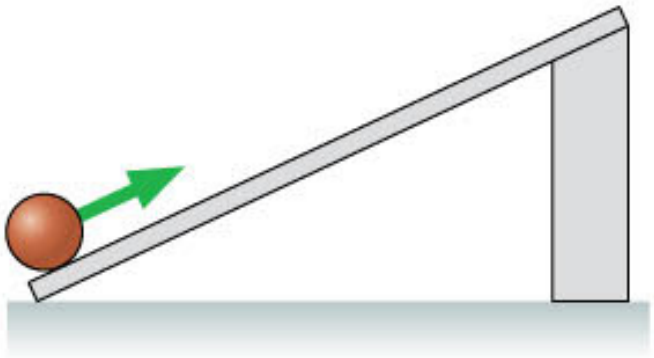
A. Positive.

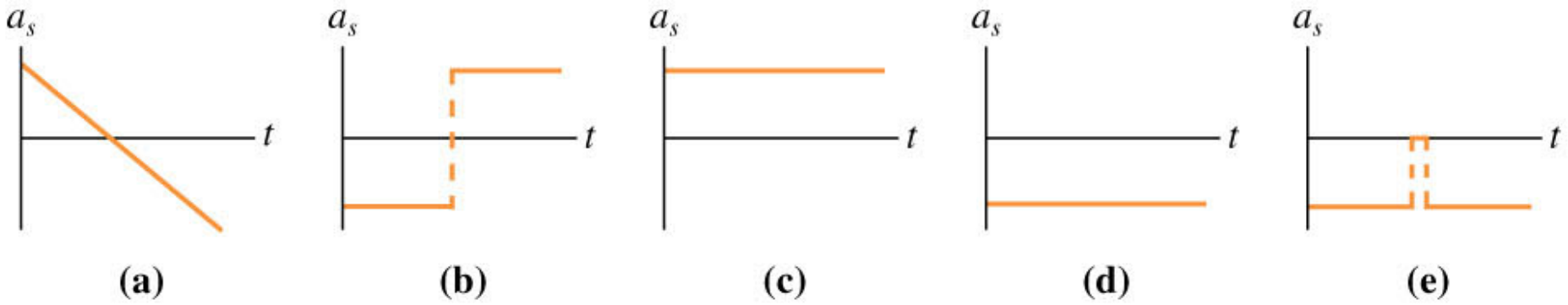
✔ **B. Negative.**

C. Zero.

QuickCheck 2.19

The ball rolls up the ramp, then back down. Which is the correct acceleration graph?





QuickCheck 2.19

The ball rolls up the ramp, then back down. Which is the correct acceleration graph?