

McRoberts Secondary

Kinematics Retest 4 2025-01-20



Personal Data

Family Name:

Given Name:

Signature:

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Registration Number

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In this section **no** changes or modifications must be made!

Scrambling

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Exam ID(Physics 11)
25012000001

Please mark the boxes carefully: Not marked: or

This document is scanned automatically. Please keep clean and do not bend or fold. For filling in the document please use a **blue or black pen**.

Only clearly marked and positionally accurate crosses will be processed!

Answers 1 - 15

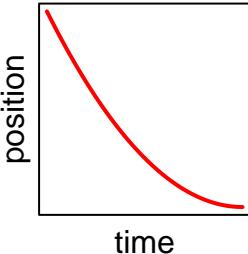
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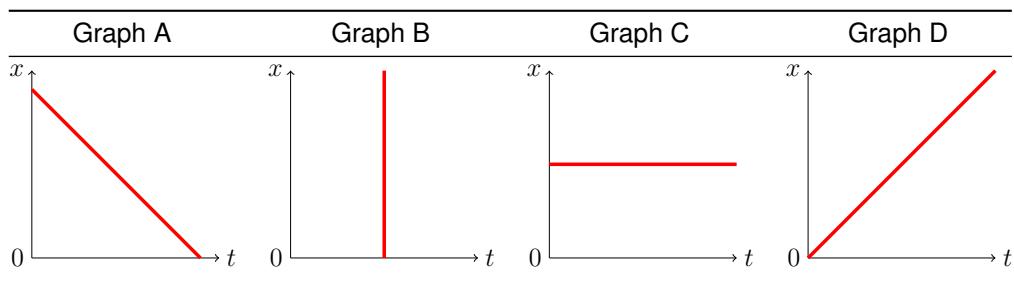
Answers 16 - 25

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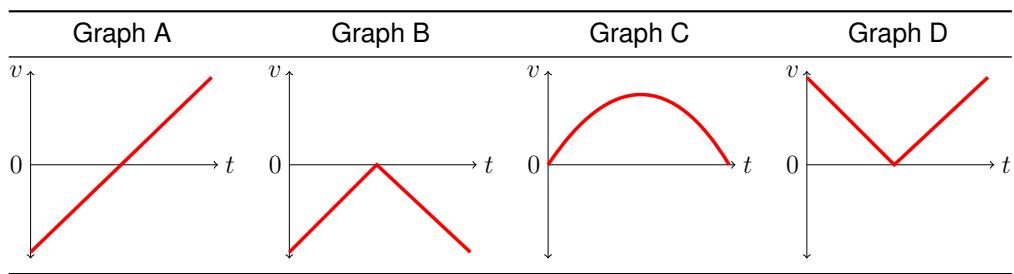
1. True or false? The area under a velocity-time graph is the displacement.
 - a. True
 - b. False
2. True or false? When you throw a ball over to your friend, the ball's velocity is zero when it reaches its maximum height.
 - a. True
 - b. False
3. True or false? If an object is moving to the right, then its acceleration must also be to the right.
 - a. True
 - b. False
4. True or false? If an object changes direction, then the line on its velocity-time graph must have a changing slope.
 - a. True
 - b. False
5. True or false? If the velocity vector and the acceleration vector both point in the same direction, then the object must be speeding up.
 - a. True
 - b. False
6. A football is kicked with a velocity of 25 m/s at an angle of 45° above the horizontal. What is the vertical component of its acceleration as it travels along its trajectory? (Ignore air resistance.)
 - a. $g \sin(45^\circ)$ upward
 - b. $g \sin(45^\circ)$ downward
 - c. g upward
 - d. g downward
7. Ball 1 is dropped from the top of a building. One second later, ball 2 is dropped from the same building. If air resistance can be ignored, then as time progresses (and while the balls are still in free fall), the distance between them
 - a. increases.
 - b. remains constant.
 - c. decreases.
 - d. cannot be determined from the given information.
8. An object is moving to the right and speeding up. Which choice best describes its velocity and acceleration? (Assume right is positive.)
 - a. velocity is positive; acceleration is negative.
 - b. velocity is negative; acceleration is positive.
 - c. velocity and acceleration are both positive.
 - d. velocity and acceleration are both negative.

9. Which of the following are scalars? *Select all that apply.*
- distance
 - time
 - displacement
 - acceleration
10. A car traveling at speed v is able to stop in a distance d . Assuming the same constant acceleration, what distance does this car require to stop when it is traveling at speed $2v$?
- d
 - $4d$
 - $\sqrt{2}d$
 - $2d$
11. Which choice best matches the given position-time graph?
- 
- a. moving to the right and speeding up.
b. moving to the right and slowing down.
c. moving to the left and speeding up.
d. moving to the left and slowing down.
12. Which velocity-time graphs represent the motion of an object that is slowing down? *Select all that apply.*
- | Graph A | Graph B | Graph C | Graph D |
|---------|---------|---------|---------|
| | | | |
- a. Graph A
b. Graph B
c. Graph C
d. Graph D
13. Which position-time graph represents an object at rest?



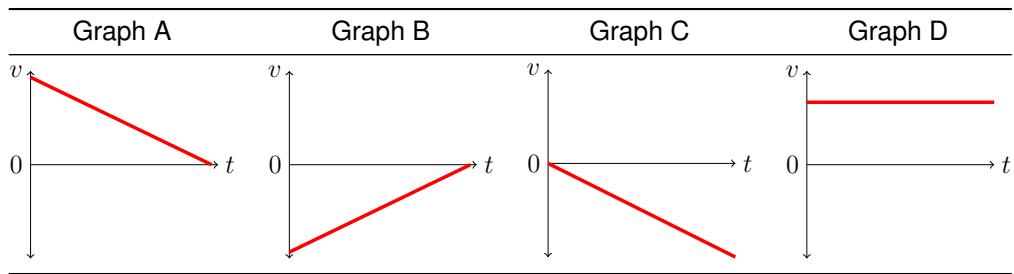
- a. Graph A
- b. Graph B
- c. Graph C
- d. Graph D

14. Which velocity-time graph represents the motion of an object that changes its direction?



- a. Graph A
- b. Graph B
- c. Graph C
- d. Graph D

15. Which velocity-time graph represents motion with constant positive acceleration?



- a. Graph A
- b. Graph B
- c. Graph C
- d. Graph D

16. Suppose an object travels at a constant velocity of 91.0 km/h. What distance would it travel in 13.0 minutes?

- a. 5.2 km
- b. 12 km
- c. 813 km
- d. 19.7 km

17. An F1 car accelerates from 0 to 60 miles per hour in 2.68 s. What is the acceleration of the car in SI units? (1 mile = 1609.34 m)
- 22.4 m/s²
 - 10 m/s²
 - 13.1 m/s²
 - 7.19 m/s²
18. A car travels 20 km at 31 km/h and 223 km at 110 km/h. What is the average speed for this trip?
- 42 km/h
 - 53 km/h
 - 38 km/h
 - 91 km/h
19. A particle initially moving with a velocity of 2 m/s in the *x*-direction experiences a constant acceleration of 1 m/s² in the *x*-direction and -2 m/s² in the *y*-direction. What are the velocity components of the particle after 4 s?
- $v_x = 4 \text{ m/s}$, $v_y = -8 \text{ m/s}$
 - $v_x = 6 \text{ m/s}$, $v_y = -8 \text{ m/s}$
 - $v_x = -6 \text{ m/s}$, $v_y = 4 \text{ m/s}$
 - $v_x = 3 \text{ m/s}$, $v_y = -2 \text{ m/s}$
20. A car with good tires on a dry road can decelerate at about 5.0 m/s² when braking. If the car travels with an initial velocity of 34 km/h and brakes under such conditions, what distance would it travel before it stops?
- 9 m
 - 13 m
 - 1 m
 - 116 m
21. A ball tossed straight up returns to its starting point in 3.33 s. What was its initial speed? Ignore air resistance.
- 11.7 m/s
 - 16.3 m/s
 - 18.5 m/s
 - 9.9 m/s
22. A golf ball is hit with an initial velocity of 14 m/s at an angle of 57° above the horizontal. What is its range (horizontal distance before hitting the ground)? Ignore air resistance and assume a flat golf course.
- 14 m
 - 25 m
 - 18 m
 - 13 m
23. A person throws a rock horizontally, with an initial velocity of 32.8 m/s, from a bridge. It falls 6.78 m to the water below. How far does it travel horizontally before striking the water?
- 38.6 m
 - 54.1 m
 - 51.7 m
 - 42.4 m

24. What is the maximum height reached by a ball thrown straight up with an initial velocity of 33.3 m/s ? Assume that the ball is thrown on the surface of the Earth and that it undergoes constant acceleration due to gravity (ignore air resistance).
- a. 83.1 m
 - b. 56.6 m
 - c. 32.5 m
 - d. 97.4 m
25. A ball is thrown straight up with an initial velocity of 38.3 m/s . How long does it take the ball to return to its starting point? Assume that the ball is thrown on the surface of the Earth and that it is undergoing constant acceleration due to gravity (ignore air resistance).
- a. 10.5 s
 - b. 14 s
 - c. 7.82 s
 - d. 14.7 s