



# McRoberts Secondary

Kinematics Retest 2 2025-11-05



## Personal Data

Family Name:	
Given Name:	
Signature:	
	checked

## Registration Number

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

Scrambling

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Type

025

Exam ID(Physics 11)

25110500003

Please mark the boxes carefully: ☒ Not marked: ☐ or ☐

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**Only clearly marked and positionally accurate crosses will be processed!**

## Answers 1 - 15

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## Answers 16 - 25

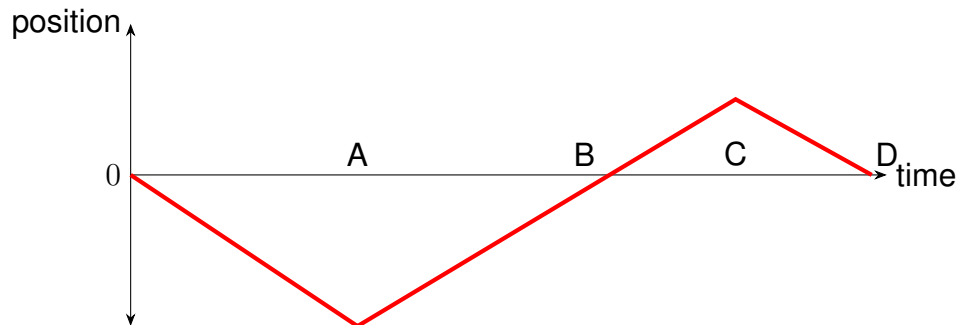
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	a	b	c	d



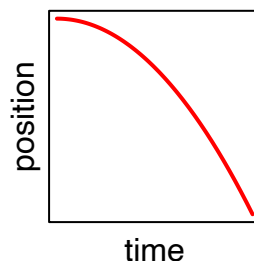
1. True or false? When a ball is thrown straight up, its velocity at the top is zero.
  - a. True
  - b. False
2. True or false? An object which is slowing down is represented on a velocity-time graph by a line with a negative slope.
  - a. True
  - b. False
3. True or false? If an object is moving to the right, then its velocity must also be to the right.
  - a. True
  - b. False
4. 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
5. True or false? If an object is moving to the right, then its acceleration must also be to the right.
  - a. True
  - b. False
6. 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  $7v$ ?
  - a.  $d$
  - b.  $49d$
  - c.  $\sqrt{7}d$
  - d.  $7d$
7. The gravitational acceleration on Mars is about one-third of that on Earth. If you hit a baseball on Mars with the same speed and angle that you do on Earth, the ball would land
  - a.  $1/9$  times as far
  - b.  $1/3$  times as far
  - c. 3 times as far
  - d. 9 times as far
8. Suppose that several projectiles are launched. Which one will be in the air for the longest time?
  - a. The one with the furthest horizontal range.
  - b. The one with the greatest maximum height.
  - c. The one with the greatest initial speed.
  - d. None of the above.
9. 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.

10. Which has the greater acceleration: a car that increases its speed from 50 to 60 km/h, or a bike that goes from 0 to 10 km/h in the same time?
- The car has the greater acceleration.
  - The bike has the greater acceleration.
  - The car and the bike have the same acceleration.
  - Not enough information given to determine the answer.

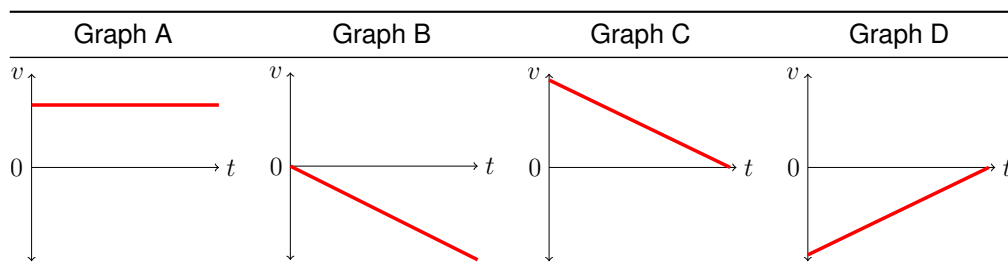
11. The motion of an object is described by the following position-time graph. At which point in time is the magnitude of the object's displacement at a maximum?



- Point A
  - Point B
  - Point C
  - Point D
12. Which choice best matches the given position-time graph?

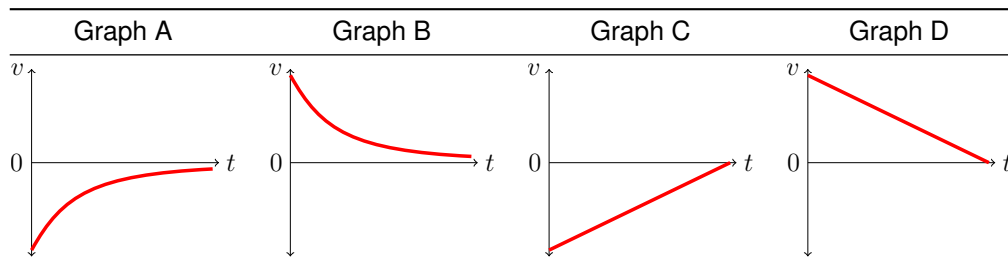


- moving to the right and speeding up.
  - moving to the right and slowing down.
  - moving to the left and speeding up.
  - moving to the left and slowing down.
13. What is the magnitude of the slope of a position-time graph?
- acceleration
  - distance
  - speed
  - velocity
14. Which velocity-time graph represents motion with constant positive acceleration?



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

15. Which velocity-time graphs represent the motion of an object that is slowing down? *Select all that apply.*



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

16. A car travels 38 km at 45 km/h and 209 km at 114 km/h. What is the average speed for this trip?

- a. 92 km/h
- b. 102 km/h
- c. 67 km/h
- d. 106 km/h

17. A car accelerates from 43 km/h to 114 km/h, at an average rate of  $6 \text{ m/s}^2$ . How much time does it take to complete this speed increase?

- a. 1.02 s
- b. 11.8 s
- c. 2.33 s
- d. 3.29 s

18. An F1 car accelerates from 0 to 60 miles per hour in 2.1 s. What is the acceleration of the car in SI units? (1 mile = 1609.34 m)

- a.  $12.8 \text{ m/s}^2$
- b.  $10.6 \text{ m/s}^2$
- c.  $23.1 \text{ m/s}^2$
- d.  $28.6 \text{ m/s}^2$

19. A runner completes a marathon (42.195 km) with an average pace of 8 minutes and 55 seconds per kilometre. What is the runner's time for the marathon? (Answers are formatted as hours : minutes : seconds)
- 06 : 16 : 14
  - 04 : 34 : 06
  - 04 : 29 : 53
  - 05 : 03 : 40
20. A particle initially moving with a velocity of 2 m/s in the  $x$ -direction experiences a constant acceleration of  $1 \text{ m/s}^2$  in the  $x$ -direction and  $-2 \text{ m/s}^2$  in the  $y$ -direction. What are the velocity components of the particle after 4 s?
- $v_x = 3 \text{ m/s}, v_y = -2 \text{ m/s}$
  - $v_x = 4 \text{ m/s}, v_y = -8 \text{ m/s}$
  - $v_x = 6 \text{ m/s}, v_y = -8 \text{ m/s}$
  - $v_x = -6 \text{ m/s}, v_y = 4 \text{ m/s}$
21. A person throws a rock straight down from a bridge with an initial speed of 25.9 m/s. It falls 10.2 m to the water below. How much time does it take for the rock to hit the water?
- 0.24 s
  - 0.34 s
  - 0.37 s
  - 0.36 s
22. A ball is thrown straight up with an initial velocity of 16.8 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).
- 4.41 s
  - 2.13 s
  - 3.43 s
  - 3.93 s
23. What is the maximum height reached by a ball thrown straight up with an initial velocity of 20 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).
- 16 m
  - 20.4 m
  - 21.9 m
  - 12.9 m
24. A ball tossed straight up returns to its starting point in 5.42 s. What was its initial speed? Ignore air resistance.
- 26.6 m/s
  - 22.6 m/s
  - 24.3 m/s
  - 21.5 m/s

25. A golf ball is hit with an initial velocity of 38 m/s at an angle of  $73^\circ$  above the horizontal. What is its range (horizontal distance before hitting the ground)? Ignore air resistance and assume a flat golf course.
- a. 115 m
  - b. 82 m
  - c. 67 m
  - d. 122 m