McRoberts Secondary

Kinematics Exam (Physics 11) 2025-09-30

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Answers 1 - 15

	a	b	c	d
1	☐	☐	☐	☐
2	☐	☐	☐	☐
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13	☐	☐	☐	☐
14	☐	☐		
15	☐	☐	☐	☐
	a	b	c	d

Answers 16 - 30

	a	b	c	d
16	☐	☐	☐	☐
17	☐	☐	☐	☐
18	☐	☐	☐	☐
19	☐	☐	☐	☐
20	☐	☐	☐	☐
21	☐	☐	☐	☐
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23	☐	☐		
24	☐	☐	☐	☐
25	☐	☐	☐	☐
26	☐	☐	☐	☐
27	☐	☐	☐	☐
28	☐	☐	☐	☐
29	☐	☐	☐	☐
30	☐	☐	☐	☐
	a	b	c	d

Answers 31 - 38

	a	b	c	d
31	☐	☐	☐	☐
32	☐	☐	☐	☐
33	☐	☐	☐	☐
34	☐	☐	☐	☐
35	☐	☐	☐	☐
36	☐	☐	☐	☐
37	☐	☐	☐	☐
38	☐	☐	☐	☐
	a	b	c	d

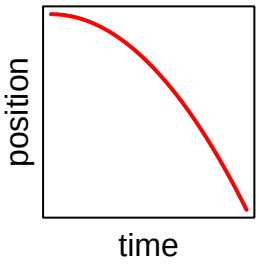
1. How many seconds would it take the Sun's light to reach Earth? The speed of light in vacuum is 3.0×10^{8} m/s. The Sun is 1.5×10^{11} m from the Earth.

   a. 2.0×10^{-3} s
   b. 0 s
   c. 4.5×10^{19} s
   d. 5.0×10^{2} s

2. Suppose an object travels at a constant velocity of 1.38 m/s. What distance would it travel in 744 s?

   a. 1030 m
   b. 270 m
   c. 539 m
   d. 0.00185 m

3. Which choice best matches the given position-time graph? Assume that position is increasing to the right.



   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.

4. A 5 kg ball and a 10 kg ball are both dropped off a cliff at the same time. If air drag can be ignored, then the 10 kg ball falls

   a. **50% faster** than the 5 kg ball.
   b. with **double the velocity** of the 5 kg ball.
   c. with **double the acceleration** of the 5 kg ball.
   d. with the **same acceleration** as the 5 kg ball.

5. For which of the following is the magnitude of the displacement equal to the distance traveled? *Select all that apply.*

   a. A student pacing back and forth thinking about physics.
   b. An athlete running a lap around the track.
   c. A train moving with constant velocity.
   d. A car coming to a stop in a straight line.

6. True or false? When you throw a ball to your friend, the ball's acceleration is zero when it reaches its maximum height.

   a. True
   b. False

7. True or false? It is possible to have zero acceleration and still be moving.
    a. True
    b. False
8. Consider a ball that is thrown upwards and which then falls back down. If up is the positive direction, then the ball's velocity
    a. is always positive.
    b. is always negative.
    c. starts positive, then becomes negative.
    d. starts negative, then becomes positive.
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. 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
11. Consider a ball that is thrown upwards and which then falls back down. If up is the positive direction, then the ball's acceleration
    a. is always positive.
    b. is always negative.
    c. starts positive, then becomes negative.
    d. starts negative, then becomes positive.
12. What is the magnitude of the average **velocity** of a runner who completes one lap around an outdoor track (400 m) in 100 s?
    a. 4.0 m/s
    b. 0.25 m/s
    c. 0 m/s
    d. 4.0×10^4 m/s
13. A car travels at 50 km/h for 30 minutes and 80 km/h for 1 hour and 15 minutes. How far does it travel in this time?
    a. 113.75 km
    b. 130 km
    c. 125 km
    d. 117 km
14. True or false? When a ball is thrown straight up, its acceleration at the top is zero.
    a. True
    b. False

15. When describing the motion of an object, distance is

    a. the scalar of the object's velocity.
    b. the amount of ground covered by the moving object.
    c. how far the object ends up relative to its starting position.
    d. the direction in which the object moves.

16. Which of the following objects are accelerating? *Select all that apply.*

    a. A laptop cart moving up a ramp at constant speed.
    b. An apple at rest in a fruit bowl.
    c. A car speeding up in a straight line.
    d. A car slowing down in a straight line.

17. Suppose an object travels at a constant velocity of 20 km/h. What distance would it travel in 74 minutes?

    a. 16 km
    b. 25 km
    c. 1500 km
    d. 0.062 km

18. What is the magnitude of the slope of a position-time graph?

    a. displacement
    b. speed
    c. acceleration
    d. distance

19. Which of the following is a vector quantity?

    a. speed
    b. distance
    c. acceleration
    d. time

20. Can an object's velocity change direction when its acceleration is constant?

    a. No, because the object is always speeding up.
    b. No, because the object is always speeding up or slowing down, but it can never turn around.
    c. Yes, a rock thrown straight up is an example.
    d. Yes, a car that starts from rest, speeds up, slows to a stop, and then backs up is an example.

21. A scalar quantity is fully described by

    a. magnitude alone
    b. direction alone
    c. both magnitude and direction
    d. none of these

22. Which of the following is an accurate statement about motion with constant acceleration?

    a. In equal times, speed increases by equal amounts.
    b. In equal times, displacement changes by equal amounts.
    c. In equal times, velocity changes by equal amounts.
    d. In equal times, acceleration changes by equal amounts.

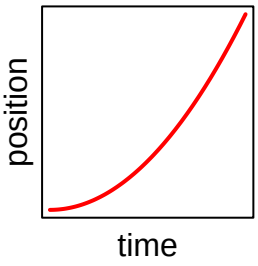
23. True or false? When a ball is thrown straight up, its velocity at the top is zero.

    a. True
    b. False

24. Which of the following is a scalar quantity?

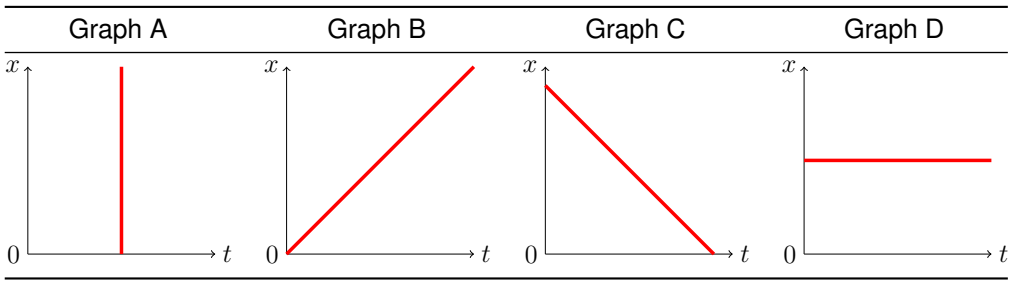
    a. acceleration
    b. displacement
    c. velocity
    d. time

25. Which choice best matches the given position-time graph? Assume that position is increasing to the right.



    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.

26. Which position-time graph represents an object at rest?



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

27. Which of the following are scalars? *Select all that apply.*
    a. speed
    b. distance
    c. displacement
    d. velocity

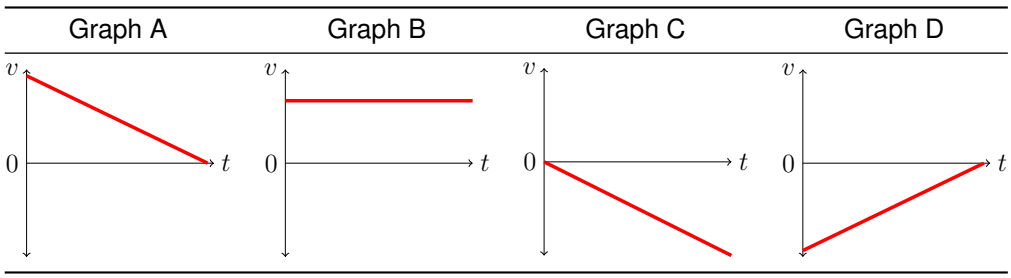
28. An object is released from rest and falls straight down without friction. Which of the following is true concerning its motion?
    a. Acceleration is constant.
    b. Velocity is constant.
    c. Neither acceleration nor velocity is constant.
    d. Both acceleration and velocity are constant.

29. Which of the following are vectors? *Select all that apply.*
    a. speed
    b. time
    c. displacement
    d. velocity

30. When describing the motion of an object, displacement is
    a. how far and in which direction the object ends up relative to its starting position.
    b. the direction in which the object moves.
    c. the amount of ground covered by the moving object.
    d. the scalar of the object's velocity.

31. Identify the following quantity as being either a scalar or a vector: ** 9.8 m/s/s**
    a. scalar
    b. vector
    c. both scalar and vector
    d. neither scalar nor vector

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



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

33. You hit a volley ball over the net. When the ball reaches its maximum height, its speed is

    a. zero.
    b. less than its initial speed.
    c. equal to its initial speed.
    d. greater than its initial speed.

34. Suppose an object travels 16.9 metres in 82.6 seconds. What is its average speed?

    a. 0.102 m/s
    b. 0.205 m/s
    c. 1400 m/s
    d. 4.89 m/s

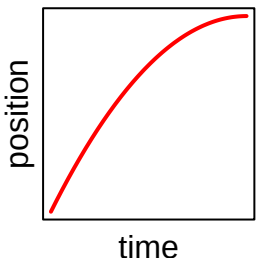
35. A vector quantity is fully described by

    a. magnitude alone
    b. direction alone
    c. both magnitude and direction
    d. none of these

36. Suppose an object travels at a constant velocity of 2.58 m/s. How much time would it take for the object to travel a distance of 42.5 m?

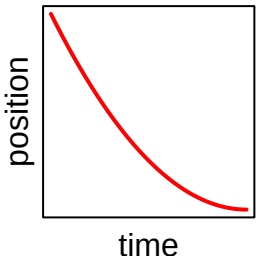
    a. 110 s
    b. 0.0607 s
    c. 16.5 s
    d. 32.9 s

37. Which choice best matches the given position-time graph? Assume that position is increasing to the right.



    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.

38. Which choice best matches the given position-time graph? Assume that position is increasing to the right.



a. moving to the right and speeding up.
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