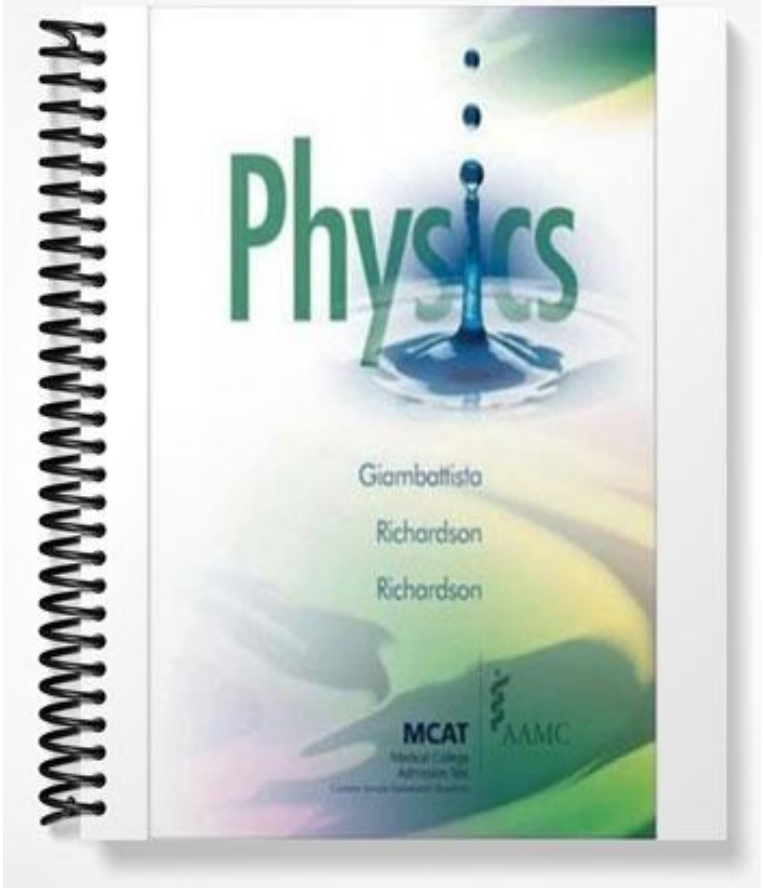
TEST BANK



Chapter 2 Motion Along a Line

Student: _____

1. On a graph of v_x versus time, the area under the graph represents:
A. the change in the x-component of the velocity.
B. the x-component of the displacement.
C. the x-component of the velocity.
D. the x-component of the acceleration.

2. On a graph of v_x versus time, the slope represents:
A. the change in the x-component of the velocity.
B. the x-component of the displacement.
C. the x-component of the velocity.
D. the x-component of the acceleration.

3. On a graph of x versus time, the area under the graph represents:
A. the change in the x-component of the velocity.
B. the x-component of the distance.
C. the x-component of the velocity.
D. the x-component of the acceleration.

4. On a graph of x versus time, the slope represents:
A. the change in the x-component of the velocity.
B. the x-component of the displacement.
C. the x-component of the velocity.
D. the x-component of the acceleration.

5. Displacement is:
A. the distance traveled from the first position to the final position.
B. the distance from the origin to the final position.
C. the change of the position vector from the first position to the final position.
D. the vector from the origin to the final position.

6. If an object is located 20 m to the right of the origin at 1:00 PM and later the object is located 30 m to the right of the origin at 2:00 PM, then the displacement from 1:00 PM to 2:00 PM is:
A. 50 m to the right.
B. 30 m to the right.
C. 25 m to the right.
D. 20 m to the right.
E. 10 m to the right.

7. A walker walks 30 m from the origin toward the EAST to point A. She then walks from point A 20 m more toward the EAST to point B. The walker's total displacement from the origin is:
A. 50 m toward the EAST
B. 30 m toward the WEST
C. 20 m toward the WEST
D. 10 m toward the EAST
E. 10 m toward the WEST

8. A runner runs 10 m from the origin toward the WEST to point A. He then runs from point A, 20 m more toward the WEST to point B. He then runs from point B, 30 m more toward the WEST to point C. The runner's total displacement from the origin to point C is:
A. 60 m toward the WEST
B. 50 m toward the WEST.
C. 20 m toward the WEST.
D. 10 m toward the WEST.
E. 0 m

9. A walker starts at the origin at 1:00 PM and walks 3.0 km from the origin toward the WEST to point A. She arrives at point A at 2:30 PM. She then walks from point A, 2.0 km toward the WEST to point B and arrives at point B at 3:45 PM. The walker's average velocity for the entire trip is:
A. 1.8 km/hr toward the EAST
B. 1.8 km/hr toward the WEST
C. 1.3 km/hr toward the WEST
D. 1.3 km/hr toward the EAST
E. 0.36 km/hr toward the WEST

10. A car travels a distance of 100 km in 2.00 hours. It then travels an additional distance of 60.0 km in 1.00 hour. The average speed of the car for the entire trip is:
A. 80.0 km/hr
B. 60.0 km/hr
C. 53.3 km/hr
D. 50.0 km/hr
E. 46.7 km/hr

11. A car travels at 50.0 km/hr for 2.00 hours. It then travels an additional distance of 40.0 km in 1.00 hour. The average speed of the car for the entire trip is:
A. 61.0 km/hr
B. 57.1 km/hr
C. 53.3 km/hr
D. 46.7 km/hr
E. 30.0 km/hr

12. A car travels for 140 km at 70.0 km/hr. It then travels an additional distance of 60.0 km 40.0 km/hr. The average speed is:
A. 61.0 km/hr
B. 57.1 km/hr
C. 53.3 km/hr
D. 46.7 km/hr
E. 45.0 km/hr

13. A vector A is directed along the positive x-axis and has a magnitude of 3.00 units. Vector B is directed along the negative x-axis and has a magnitude of 2.00 units. The magnitude and direction of the vector A + B is:
A. 3.00 units in the positive x direction.
B. 1.00 units in the positive x direction.
C. 3.00 units in the negative x direction.
D. 1.00 units in the negative x direction.

14. A vector A is directed along the positive x-axis and has a magnitude of 3.00 units. Vector B is directed along the negative x-axis and has a magnitude of 2.00 units. The magnitude and direction of the vector A - B is:
A. 3.00 units in the positive x direction.
B. 1.00 units in the negative x direction.
C. 3.00 units in the negative x direction.
D. 5.00 units in the positive x direction.

15. A vector A is directed along the positive x-axis and has a magnitude of 3.00 units. Vector B is directed along the negative x-axis and has a magnitude of 2.00 units. The magnitude and direction of the vector B – A is:
A. 3.00 units in the positive x direction.
B. 1.00 units in the positive x direction.
C. 3.00 units in the negative x direction.
D. 5.00 units in the negative x direction.

16. The graph shows v_x versus t for an object moving along straight line. What is the average velocity from t = 0 to t = 11 s?

A. 26 m/s^2
B. 36 m/s^2
C. 30 m/s^2
D. 23 m/s^2

17. The figure shows the graph of v_x versus time for an object moving along the x-axis. Solve graphically for the distance traveled between t = 5.0 s and t = 9.0 s

A. 110 m
B. 140 m
C. 100 m
D. 130 m

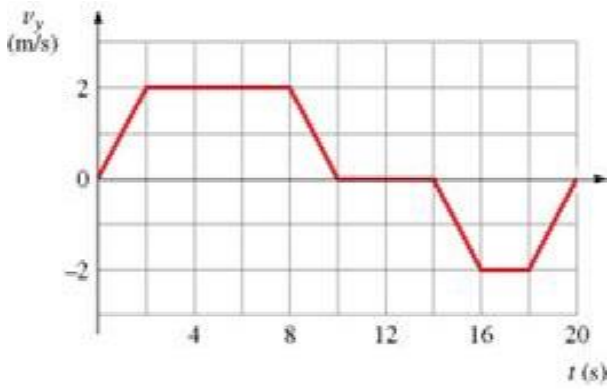
18. The graph shows v_x versus t for an object moving in a straight line. What is the average velocity from t = 0 s to t = 9 s?

A. 44 m/s^2
B. 32 m/s^2
C. 22 m/s^2
D. 27 m/s^2

19. The graph shows the speedometer reading of a car as it come to a stop along a straight-line path. How far does the car move between t = 0 s and t = 16 s?

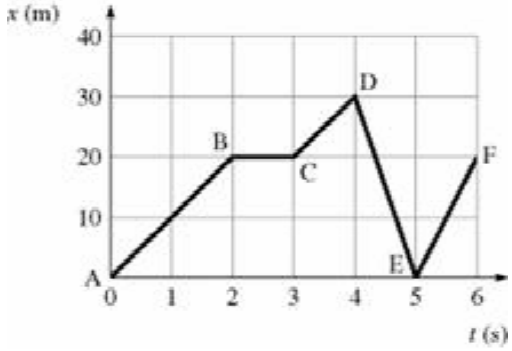
A. 40 m
B. 140 m
C. 80 m
D. 160 m

20. The figure is a graph of the vertical velocity versus time for an elevator. Solve graphically for the height of the elevator above the starting point at t = 20 s:



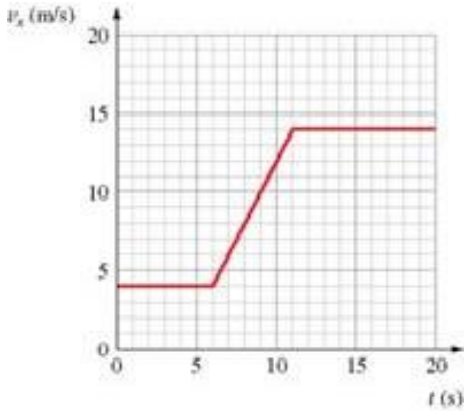
A. 4.0 m
B. 16.0 m
C. 0.0 m
D. 8.0 m

21. The figure is a graph of an object moving in a straight line. Solve graphically to determine which section of the path has the highest speed:



A. DE
B. EF
C. CD
D. AB

22. The figure is a graph of v_x(t) for a car. Solve graphically for the distance traveled from t = 9 s to t = 15 s:



A. 75m
B. 70 m
C. 84 m
D. 80 m

23. The figure shows the graph of v_x versus time for an object moving along the x-axis. What is the acceleration at t = 3 s?

A. 4.0 m/s^2
B. 0.0 m/s^2
C. 1.5 m/s^2
D. 2.4 m/s^2

24. The figure shows the graph of v_x versus time for an object moving along the x-axis. Solve graphically for the distance traveled from $t = 9.0$ s to $t = 13.0$ s:

A. 60 m
B. 84 m
C. 76 m
D. 80 m

25. A 4.0 kg mass has a velocity of 12 m/s to the WEST. The 4.0 kg mass undergoes an acceleration of 2.0 m/s^2 to the WEST for 3.0 sec. What is the velocity of the 4.0 kg mass at the end of the 3.0 sec interval?
A. 18 m/s to the WEST
B. 6.0 m/s to the WEST
C. 0.0 m/s
D. 6.0 m/s to the EAST
E. 18 m/s to the EAST

26. A 4.0 kg mass has a velocity of 10 m/s to the EAST. The 4.0 kg mass undergoes an acceleration of 4.0 m/s^2 to the WEST for 3.0 sec. What is the velocity of the 4.0 kg mass at the end of the 3.0 sec interval?
A. 22 m/s to the WEST
B. 2.0 m/s to the WEST
C. 0.0 m/s
D. 2.0 m/s to the EAST
E. 22 m/s to the EAST

27. A car traveling at 3.0 m/s has a constant acceleration of 4.0 m/s^2. After 2.0 seconds, the velocity is:
A. 5.0 m/s
B. 7.0 m/s
C. 9.0 m/s
D. 11 m/s
E. 13 m/s

28. A car starts from rest and travels a distance of 100 m in 10 seconds. The acceleration of the car is:
A. 1.0 m/s^2
B. 2.0 m/s^2
C. 2.5 m/s^2
D. 3.0 m/s^2
E. 3.5 m/s^2

29. The figure shows the speedometer readings as a car comes to a stop. Solve graphically for the acceleration at t = 7.0 s:

A. 2.5 m/s^2
B. - 2.5 m/s^2
C. - 2.0 m/s^2
D. 2.0 m/s^2

30. The graph shows v_x versus t for an object moving along straight line. What is the acceleration at t = 11 s?

A. -10 m/s^2
B. 10 m/s^2
C. 22 m/s^2
D. -22 m/s^2

31. A car traveling at 4.0 m/s has a constant acceleration of 2.0 m/s^2. After 3.0 seconds, the average velocity during the acceleration is:
A. 5.0 m/s
B. 7.0 m/s
C. 9.0 m/s
D. 11 m/s
E. 13

32. The figure shows the graph of v_x versus time for an object moving along the x-axis. Solve graphically for the acceleration at $t = 8.0$ s:

A. 4.0 m/s^2
B. 5.0 m/s^2
C. 0.5 m/s^2
D. 0.4 m/s^2

33. A car starts from rest and moves with a constant acceleration of 5.0 m/s^2. How long will it take to reach a speed of 45.0 m/s?
A. 3.0 s
B. 9.0 s
C. 5.0 s
D. 11 s

34. Which car has a westward acceleration?
A. a car moving west at constant speed.
B. a car moving east and speeding up.
C. a car moving east and slowing down.
D. a car moving west and slowing down.

35. A car traveling at 4.0 m/s has a constant acceleration of 2.0 m/s^2. After 3.0 seconds, the distance traveled during the acceleration is:
A. 21 m
B. 17 m
C. 10 m
D. 13 m
E. 9 m

36. A boat is traveling at 4.0 m/s as it passes the starting line of a race. If the boat accelerates at 2.0 m/s^2 for 3.0 seconds, then the velocity the boat has after the 3.0 seconds is:
A. 21 m/s
B. 9.0 m/s
C. 13 m/s
D. 10 m/s
E. 4.0 m/s

37. A boat is traveling at 4.0 m/s as it passes the starting line of a race. If the boat accelerates at 1.0 m/s^2 for 6.0 seconds, then the distance the boat has traveled after 6.0 seconds is:
A. 42 m
B. 18 m
C. 26 m
D. 20 m
E. 14 m

38. A boat is traveling at 4.0 m/s as it passes the starting line of a race. If the boat accelerates at 1.0 m/s^2 for 6.0 seconds, then the average velocity of the boat for the 6.0 seconds is:
A. 21 m/s
B. 9.0 m/s
C. 13 m/s
D. 10 m/s
E. 7.0 m/s

39. A car starts from rest and travels a distance of 100 m in 20 seconds with a constant acceleration. The velocity of the car is at the end of the 20 second interval is:
A. 25 m/s
B. 20 m/s
C. 15 m/s
D. 10 m/s
E. 5.0 m/s

40. A car starts from rest and travels a distance of 100 m in 15.0 seconds with a constant acceleration. The average velocity of the car for the 15 seconds interval is:
A. 24.0 m/s
B. 21.0 m/s
C. 16.7 m/s
D. 13.3 m/s
E. 6.67 m/s

41. A runner starts from rest and with an acceleration of 1.0 m/s^2 travels a distance of 10 meters. The time it takes the runner to cover the distance is:
A. 6.3 s
B. 5.7 s
C. 5.0 s
D. 4.5 s
E. 3.8 s

42. A runner starts from rest and with an acceleration of 2.0 m/s^2 travels a distance of 12 meters. The velocity of the runner at the end of the distance is:
A. 3.4 m/s
B. 5.7 m/s
C. 6.9 m/s
D. 7.5 m/s
E. 8.1 m/s

43. A car starting from rest travels a distance of 20.0 m with a constant acceleration of 2.0 m/s^2. The car then slows to a stop in 10.0 seconds with a constant negative acceleration. The distance traveled by the car is:
A. 36 m
B. 46 m
C. 50 m
D. 58 m
E. 65 m

44. A 3.0 kg ball is thrown vertically into the air with an initial velocity of 15 m/s. The maximum height of the ball is:
A. 13 m
B. 11 m
C. 10 m
D. 9.5 m
E. 9.0 m

45. A 3.0 kg ball is thrown vertically into the air with an initial velocity of 15.0 m/s. The time it takes the ball to reach its maximum height is:
A. 0.8 s
B. 0.9 s
C. 1.2 s
D. 1.3 s
E. 1.5 s

46. A 2.0 kg ball is thrown vertically into the air with an initial velocity of 10.0 m/s. The height of the ball when the velocity is 5.0 m/s is:
A. 2.6 m
B. 1.8 m
C. 3.8 m
D. 2.0 m
E. 4.0 m

47. A 2.00 kg ball is thrown vertically into the air. The height of the ball when the velocity is 5.00 m/s is 6.07 m. What is the initial velocity of the ball?
A. 8.50 m/s
B. 10.0 m/s
C. 11.2 m/s
D. 12.0 m/s
E. 14.5 m/s

48. When an object is released from rest and falls (where there is no friction), which of the following is true?
A. the velocity is constant.
B. the acceleration is constant.
C. both the acceleration and velocity are constant.
D. Neither the acceleration nor velocity is constant.

49. A skydiver jumps from an airplane. When she reaches terminal velocity, her acceleration is?
A. essentially zero.
B. in the upward direction.
C. approximately 9.8 m/s2 downward.
D. constant upward.

50. A ball is thrown straight up. What is its acceleration just before it reaches its highest point?
A. zero
B. slightly less then g.
C. exactly g.
D. slightly greater than g.

51. Ball A is dropped from the top of a building. One second later, ball B is dropped from the same building. As time progresses, the distance between them:
A. increases.
B. remains constant.
C. decreases.
D. cannot be determined from the given information.

52. A rock is dropped down a well that is 90.0 m deep. How long before you hear the splash (the velocity of sound is 343 m/s)?
A. 3.26 s
B. 4.55 s
C. 0.262 s
D. 4.29 s

53. A rock is thrown straight up, reaches a maximum height, which of the following describes the motion at the maximum height?
A. the velocity is zero and the acceleration is zero
B. the velocity is maximum and the acceleration is zero
C. the acceleration is increasing and the velocity is zero
D. the acceleration is not changing and the velocity is zero

54. A ball is thrown upward at a velocity of 19.6 m/s. What is its velocity after 3.00 s?
A. 9.80 m/s up
B. zero
C. 19.6 down
D. 9.80 m/s down

55. A bullet shot straight up returns to its starting point in 10 s. What is the initial speed of the bullet?
A. 98 m/s
B. 49 m/s
C. 25 m/s
D. 9.8 m/s

56. A ball is thrown downward from the top of a building with an initial speed of 25 m/s. It hits the ground in 2.0 s. How high is the building?
A. 70 m
B. 50 m
C. 30 m
D. 20 m

57. Two balls are thrown from the top of a building. One is thrown up and the other is thrown down, both with the same initial speed. What are their speeds when they hit the street?
A. They are traveling at the same speed
B. The one thrown down is traveling faster
C. The one thrown up is traveling faster
D. It depends on the height of the building

58. A ball is thrown straight up with an initial speed of 30 m/s. What is its speed after 4.2 s?
A. 72 m/s
B. 42 m/s
C. 30 m/s
D. 11 m/s

59. A ball is thrown straight up with a speed of 30.0 m/s. What is the maximum height reached by the ball?
A. 132 m
B. 92.0 m
C. 46.0 m
D. 21.0 m

60. Human reaction time is usually greater that 0.10 s. If your friend holds a ruler between your fingers and releases it without warning, how far can you expect the ruler to fall before you catch it?
A. at least 3.0 cm
B. at least 4.9 cm
C. at least 6.8 cm
D. at least 9.8 cm

61. A ball is thrown straight up, reaches a maximum height, then falls to its initial height. As the ball is going up:
A. both its velocity an its acceleration point downward.
B. its velocity points downward and its acceleration points upward
C. its velocity points upward and its acceleration points downward
D. both its velocity and its acceleration point upward.

Chapter 2 Motion Along a Line Key

1. B
2. D
3. B
4. C
5. C
6. E
7. A
8. A
9. B
10. C
11. D
12. B
13. B
14. D
15. D
16. A
17. B
18. D
19. D
20. B
21. A
22. D
23. B
24. D
25. A
26. B
27. D
28. B
29. B

30. A

31. B

32. B

33. B

34. C

35. A

36. D

37. A

38. E

39. D

40. E

41. D

42. C

43. E

44. B

45. E

46. C

47. D

48. B

49. C

50. C

51. A

52. B

53. D

54. D

55. B

56. A

57. A

58. D

59. C

60. B

61. C