Chapter 2 Test Bank - Motion Along a Line

Student: _____

1. Which of the following specifications would allow you to precisely meet someone for an appointment?

   A. meet me at my car
   B. meet me at my office, room 203 in Williams Hall on campus
   C. meet me at my office, room 203 in Williams Hall on campus at 2:30 PM
   D. meet me at my office
   E. meet me at 2:30 PM

2. 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 the final position.
   D. the vector from the first position to the final position.

3. 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.

4. If an object is located 20 m to the left 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 left.
   E. 10 m to the left.

5. 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 left 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. 50 m to the left.
   C. 30 m to the right.
   D. 30 m to the left.
   E. 10 m to the left.

6. 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.

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 WEST 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 walker walks 30 m from the origin toward the WEST 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.

9. 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.

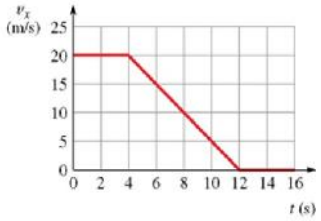
10. A runner runs 10 m from the origin toward the WEST to point A. He then runs from point A 20 m more toward the EAST to point B. He then runs from point B 30 m more toward the WEST to point C. The runner's total displacement from the origin to point C is
A. 60 m toward the WEST.
B. 50 m toward the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

11. 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 EAST 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 EAST.
C. 20 m toward the WEST.
D. 10 m toward the EAST.
E. 0 m.

12. A displacement vector D is given as 40.0 m long at an angle of 60.0 degrees NORTH of EAST. The D_x component and the D_y component of the vector are
A. D_x = +34.6 m, D_y = +20.0 m.
B. D_x = +20.0 m, D_y = -34.6 m.
C. D_x = +20.0 m, D_y = +34.6 m.
D. D_x = -34.6 m, D_y = +20.0 m.
E. D_x = +34.6 m, D_y = -20.0 m.

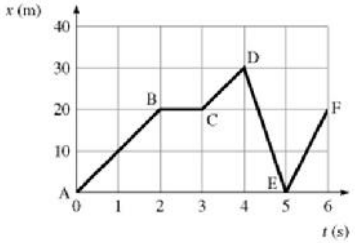
13. A displacement vector D is given as 40.0 m long at an angle of 60.0 degrees EAST of NORTH. The D_x component and the D_y component of the vector are
    A. D_x = +34.6 m, D_y = +20.0 m.
    B. D_x = +20.0 m, D_y = -34.6 m.
    C. D_x = +20.0 m, D_y = +34.6 m.
    D. D_x = -34.6 m, D_y = +20.0 m.
    E. D_x = +34.6 m, D_y = -20.0 m.

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



    A. 130 m
    B. 140 m
    C. 150 m
    D. 160 m

15. 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.

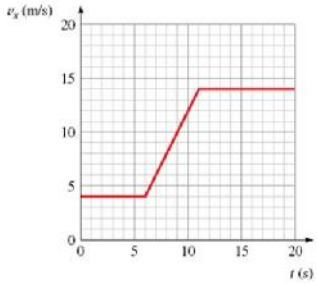


    A. DE
    B. EF
    C. CD
    D. AB

16. 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

17. The figure is a graph of $v_x(t)$ for a car. Solve graphically for the distance traveled from t = 10 s to t = 15 s.



A. 75 m
B. 70 m
C. 67 m
D. 69 m

18. 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

19. You drive five blocks due north, five blocks due east, and another two blocks due north. What is the magnitude of your displacement?
A. 7 blocks
B. 12 blocks
C. 9 blocks
D. 10 blocks
E. 8.6 blocks

20. An ant travels 30 cm east, the 25 cm north, and finally 15 cm west. What is the direction with respect to his starting point?
A. 59° N of E
B. 77º N of E
C. 29º N of E
D. 59º N of W
E. 29º N of E

21. 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.

22. 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.

23. 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.

24. 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.

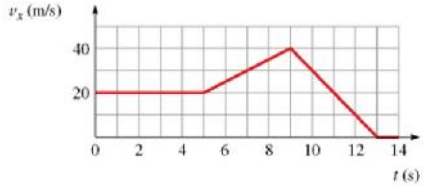
25. The graph shows v_x versus t for an object moving along straight line. What is the average velocity from t = 0 to t = 11 s?

    A. 25 m/s^2
    B. 36 m/s^2
    C. 30 m/s^2
    D. 21 m/s^2

26. 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. 24 m/s^2

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

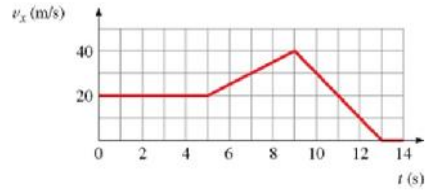


A. -10 m/s^2
B. 10 m/s^2
C. 22 m/s^2
D. -22 m/s^2

28. 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

29. The figure shows the graph of v_x versus time for an object moving along the x-axis. What is the acceleration at t = 7.0 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

30. An object starts from rest with an acceleration of 2.0 m/s^2 for 3.0 seconds. It then reduces its acceleration to 1.0 m/s^2 for 5.0 additional seconds. The velocity at the end of the 5.0 seconds interval is
A. 6.0 m/s.
B. 18 m/s.
C. 8.0 m/s.
D. 18 m/s.
E. 11 m/s.

31. An object starts from rest with an acceleration of 2.0 m/s^2 for 3.0 seconds. It then reduces its acceleration to 1.0 m/s^2 for 5.0 additional seconds. The total distance covered is
A. 52 m.
B. 38 m.
C. 11 m.
D. 9.0 m.
E. 7.6 m.

32. 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

33. 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

34. 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.

35. 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.

36. 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.

37. 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.

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 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.

39. 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.

40. 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.

41. 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.

42. A car starts from rest and travels a distance of 100 m in 15 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.

43. 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.

44. 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.

45. An object starts from rest and moves with an acceleration of 2.0 m/s^2 for 3.0 seconds. It then reduces its acceleration to 1.0 m/s^2 for 5.0 additional seconds. The velocity 8 seconds from the start of the motion is
    A. 51 m/s.
    B. 38 m/s.
    C. 11 m/s.
    D. 9.0 m/s.
    E. 7.6 m/s.

46. An object starts with an initial velocity of 4.0 m/s and accelerates with an acceleration of +4.0 m/s^2 for 6.0 seconds. It then decelerates at -2.0 m/s^2 until its velocity is 4.0 m/s. The total distance covered is
    A. 67 m.
    B. 194 m.
    C. 105 m.
    D. 288 m.
    E. 215 m.

47. 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.

48. A 2.0 kg object is moving at a velocity of 12.0 m/s. The drag force 6.0 N. If the drag force is given by the equation $F = bv^2$, then the value of b is
    A. 1.5×10^{-2} Ns^2/m^2.
    B. 4.2×10^{-2} kg/m.
    C. 3.9×10^{-1} kg/m^2.
    D. 4.2×10^{-1} N/m^2.
    E. 7.5×10^{-3} Ns^2/m^2.

49. A beetle runs an erratic pattern on a square kitchen table that is 1.5m on a side. The sides are arranged along the directions North/South and East/West. If he begins at the Southwest corner, and travels along one side to the adjacent corner in 20.0s. He then turns north, and reaches the Northeast corner 12.5s later. What is the magnitude of his average velocity for the whole trip?
    A. 0.033 m/s
    B. 0.065 m/s
    C. 0.092 m/s
    D. 0.098 m/s

50. An ant crawls in a straight line at a constant speed of 0.24m/s, beginning in the corner of a square classroom, for 3.0m. It then turns exactly 90 degrees to the right, and proceeds an additional 4.0m with a constant speed of 0.44m/s, reaching the other corner of the same wall from which it began. What was the average speed for the full trip from corner to corner?
    A. 0.32 m/s
    B. 0.23 m/s
    C. 0.30 m/s
    D. 0.34 m/s
    E. 0.21 m/s

51. An ant crawls in a straight line at a constant speed of 0.24m/s, beginning in the corner of a square classroom, for 3.00m. It then turns exactly 90 degrees to the right, and proceeds an additional 4.00m, reaching the far corner of the same wall from which it began. If the second leg was also crawled in half the amount of time as required for the first leg, what was the ant's average speed for the whole trip?
    A. 0.80 m/s
    B. 0.27m/s
    C. 0.37m/s
    D. 0.44 m/s

52. An ant crawls in a straight line at a constant speed of 0.35m/s, beginning in the corner of a square classroom that is 5.00m on a side. It first crosses the diagonal of the room, and then turns to the right, continuing at 0.45m/s to the far corner of the same wall from which it began. What was the ant's average speed for the whole trip?
    A. 0.16 m/s
    B. 0.40 m/s
    C. 0.39 m/s
    D. 0.24 m/s

53. A baseball is pitched, reaching the batter with a speed of 37 m/s, and is hit, returning on the same line at 48 m/s. If the ball was in contact with the bat for 0.22 seconds, what was the average acceleration experienced by the ball during the time of contact?
    A. 41 m/s^2
    B. 220 m/s^2
    C. 170 m/s^2
    D. 390 m/s^2

54. A 450g baseball is pitched, reaching the batter with a speed of 37 m/s, and is hit, returning on the same line at 48 m/s. If the ball was in contact with the bat for 0.22 seconds, what was the average net force experienced by the ball during the time of contact?
    A. 98N
    B. 170N
    C. 18N
    D. 77N

55.

    You drive your car 5.0 km due East at 35km/hr, and suddenly realize that you forgot your wallet. So, you return home, driving West at 40 km/hr, and upon arrival spend 10 minutes looking for it, and finally go back on the road for a total of 57.0 km due East. If your average speed was 40 km/hr for the whole journey, what was your average speed on your last leg?

    A.
    40 km/hr

    B.
    35 km/hr

    C.
    46 km/hr

    D.
    49 km/hr

56.

The interstate on-ramp is 1.5 km West of your home, and on leaving for grandmother's house you are only able to accomplish an average velocity of 12 km/hr between your home and the on-ramp. At the onramp, you wait for traffic, for 2.0 min – and then are able to proceed toward grandmother's house. If you wish to arrive there, which is 15 km South of the on-ramp, over a river and through some woods, in a total elapsed time of 25.0 minutes, what average speed must you maintain on the interstate highway?

A. 36 km/hr
B. 67 km/hr
C. none of these.
D. 58 km/hr

57.

The interstate on-ramp is 5.5 km West of your home, and on leaving for grandmother's house you are only able to accomplish an average velocity of 38 km/hr between your home and the on-ramp. At the onramp, you wait for traffic, for 2.0 min – and then are able to proceed toward grandmother's house. If you wish to arrive there, which is 15 km South of the on-ramp, over a river and through some woods, having achieved an average velocity of 42 km/hr, how fast do you need to drive south on the interstate highway?

A. 39 km/hr

B. 58 km/hr

C. 48 km/hr

D. 78 km/hr

58. 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. 120 m
C. 100 m
D. 130 m

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

60. A rock is thrown straight up and 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

61. 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

62. 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

63. 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

64. 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

65. 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

66. 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. 45.9 m
D. 21.3 m

67. 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

68. Ball A is dropped from the top of a building. One second later ball B is dropped from the same point. As time progresses, the distance between them
    A. increases.
    B. decreases.
    C. remains constant.
    D. need more information

69. 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 and 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.

70.

A sprinter runs 100.0 m in 9.87 seconds. If he travels at constant acceleration for the first 75.0 m, and then at constant velocity for the final 25.0 m, what was his acceleration during the first 75.0 m?

A. 1.58 m/s^2.
B. 2.05 m/s^2.
C. 2.10 m/s^2.
D. 2.74 m/s^2.

71.

A sprinter runs 100.0 m. If he travels at constant acceleration of 1.95 m/s^2 for the first 75.0 m, and then at constant velocity for the remaining distance, what was his total elapsed time for the whole race?

A. 10.2 s.
B. 10.1 s
C. 11.3 s.
D. 9.8 s

72.

A sprinter runs 100.0 m. If he travels at constant acceleration of 1.95 m/s^2 for the first 6.00 s, and then at constant velocity for the remaining time, what was his average velocity?

A. 9.9 m/s.
B. 10.2 m/s.
C. 8.7 m/s.
D. 9.8 m/s.

73.

An electron travels under constant acceleration from a heated filament in an electron gun to the tip of the gun, where it is emitted. If the final speed of the electron is 1.5×10^5 m/s, and the length of the gun from filament to tip is 1.25 cm, what was the acceleration the electron underwent?

A. 9.0×10^{10} m/s^2
B. 1.8×10^9 m/s^2
C. 9.0×10^9 m/s^2
D. 1.8×10^{12} m/s^2
E. 6.0×10^6 m/s^2
F. 9.0×10^{11} m/s^2

74.

A mouse is running away from a cat at 0.75 m/s, and, at 1.25 m from his mouse hole, he accelerates at a constant rate of 0.25 m/s^2 until he reaches his hole safely. How long a time was required for him to cover the last 1.25 m?

A.
1.4 s

B.
1.7 s

C.
1.2 s

D.
10 s

75. A mouse is running away from a cat at 0.75m/s, and, at 1.25m from his mouse hole, he accelerates at a constant rate until he reaches his hole safely, 0.75s later. What acceleration did he undergo during the final 1.25m of his escape?
A. 6.4 m/s^2
B. 2.4 m/s^2
C. 1.8 m/s^2
D. 4.8 m/s^2
E. 1.2 m/s^2

76. A model rocket flies upward at constant acceleration, and undergoes a displacement of 15.0m during its first 0.25s of travel. What was its speed at the end of the first 0.25s?
A. 120 m/s
B. 11 m/s
C. 30 m/s
D. 60 m/s

77. A small golden statue falls from a height of 8.2m above the top surface of a pillow. If the acceleration of the statue, upon striking the pillow, is constant, what is the value of the acceleration if the pillow compresses by 3.9cm as the statue comes to rest?
A. 210 m/s^2
B. 2100 m/s^2
C. 21 m/s^2
D. 160 m/s^2

78. If a flea can jump up to 45cm above its initial resting point, with what speed is it able to leave the ground when jumping?
    A. 4.2 m/s
    B. 8.8 m/s
    C. 3.0 m/s
    D. 2.1 m/s

79. One stone is dropped from the side of a bridge, and a second is dropped from the same place a short time later. What is true about the distance between the stones as a function of time after both have been dropped? Ignore air resistance
    A. Decreases, and then reaches a constant value
    B. Increases, finally reaching a constant value
    C. Always decreases
    D. Always increases
    E. Is constant

80. A ball is dropped at time t=0. At t=2.0s, a second ball is thrown downward with speed v. What is v if at t=4.0s, the two balls are at the same vertical position?
    A. 49 m/s
    B. 25 m/s
    C. 29 m/s
    D. 15 m/s

81.

A baseball is struck by a batter at an angle such that it reaches its maximum height at the location of the pitcher – and just grazes the top of the pitcher's head (at an elevation of 1.50 m above the launch point of the baseball). The pitcher is a horizontal distance of 20.0 m from the point at which the ball was struck. What was the launch angle for the baseball?

A.

10.6°

B.

17.4°

C.

8.53°

D.

16.7°

E.

4.29°

F.

4.31°

82.

A bas:!ball is S:ruck by a batter at an angle such that it reaches its maximum height at the location of the pitcher- and juS: grazes the top of the pitcher's head (at an elevation of 1.50m above the launch point of the bas:!ball). The pitcher is a horizontal diS:ance of 20.0 m from the point at which the ball was S:ruck. What was the launch speed for the bas:!ball?

A. 37 m/s

B. 36m/s

C. 51 m/s

D. 27m/s

Chapter 2 Test Bank - Motion Along a Line Key

1. Which of the following specifications would allow you to precisely meet someone for an appointment?
   A. meet me at my car
   B. meet me at my office, room 203 in Williams Hall on campus
   C. meet me at my office, room 203 in Williams Hall on campus at 2:30 PM
   D. meet me at my office
   E. meet me at 2:30 PM

Section: 03.01 Position and Displacement

2. 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 the final position.
   D. the vector from the first position to the final position.

Section: 03.01 Position and Displacement

3. 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.

Section: 03.01 Position and Displacement

4. If an object is located 20 m to the left 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 left.
   E. 10 m to the left.

Section: 03.01 Position and Displacement

5. 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 left 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. 50 m to the left.
   C. 30 m to the right.
   D. 30 m to the left.
   E. 10 m to the left.

Section: 03.01 Position and Displacement

6. 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.

Section: 03.01 Position and Displacement

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 WEST 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.

Section: 03.01 Position and Displacement

8.

A walker walks 30 m from the origin toward the WEST 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.

Section: 03.01 Position and Displacement

9. 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.

Section: 03.01 Position and Displacement

10. 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 EAST 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.

Section: 03.01 Position and Displacement

11. 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 EAST 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 EAST.
C. 20 m toward the WEST.
D. 10 m toward the EAST.
E. 0 m.

Section: 03.01 Position and Displacement

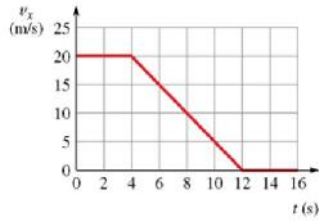
12. A displacement vector D is given as 40.0 m long at an angle of 60.0 degrees NORTH of EAST. The D_x component and the D_y component of the vector are
A. D_x = +34.6 m, D_y = +20.0 m.
B. D_x = +20.0 m, D_y = -34.6 m.
C. D_x = +20.0 m, D_y = +34.6 m.
D. D_x = -34.6 m, D_y = +20.0 m.
E. D_x = +34.6 m, D_y = -20.0 m.

Section: 03.01 Position and Displacement

13. A displacement vector D is given as 40.0 m long at an angle of 60.0 degrees EAST of NORTH. The D_x component and the D_y component of the vector are
A. D_x = +34.6 m, D_y = +20.0 m.
B. D_x = +20.0 m, D_y = -34.6 m.
C. D_x = +20.0 m, D_y = +34.6 m.
D. D_x = -34.6 m, D_y = +20.0 m.
E. D_x = +34.6 m, D_y = -20.0 m.

Section: 03.01 Position and Displacement

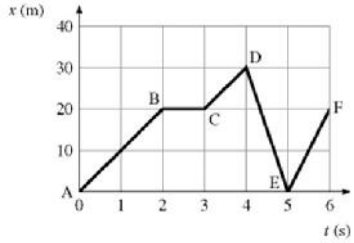
14. The graph shows the speedometer reading of a car as it comes to a stop along a straight-line path. How far does the car move between t = 0 s and t = 16 s?



A. 130 m
B. 140 m
C. 150 m
D. 160 m

Section: 03.01 Position and Displacement

15. 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

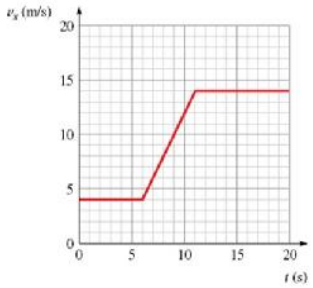
Section: 03.01 Position and Displacement

16. 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

Section: 03.01 Position and Displacement

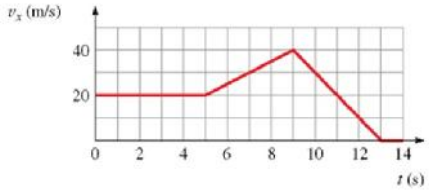
17. The figure is a graph of $v_x(t)$ for a car. Solve graphically for the distance traveled from t = 10 s to t = 15 s.



A. 75 m
B. 70 m
C. 67 m
D. 69 m

Section: 03.01 Position and Displacement

18. 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

Section: 03.01 Position and Displacement

19. You drive five blocks due north, five blocks due east, and another two blocks due north. What is the magnitude of your displacement?
A. 7 blocks
B. 12 blocks
C. 9 blocks
D. 10 blocks
E. 8.6 blocks

Section: 03.01 Position and Displacement

20. An ant travels 30 cm east, the 25 cm north, and finally 15 cm west. What is the direction with respect to his starting point?
A. 59° N of E
B. 77º N of E
C. 29º N of E
D. 59º N of W
E. 29º N of E

Section: 03.01 Position and Displacement

21. 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.

Section: 03.02 Velocity

22. 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.

Section: 03.02 Velocity

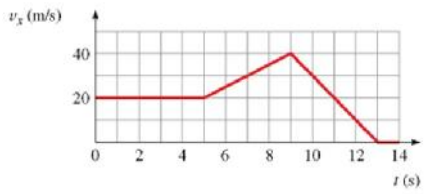
23. A car travels at 50.0 km/hr for 2.00 hours. It then travels an additional distance of 40.0 km in 1.00 hour. The average speed of the car for the entire trip is
A. 61.0 km/hr.
B. 57.1 km/hr.
C. 53.3 km/hr.
D. 46.7 km/hr.
E. 30.0 km/hr.

Section: 03.02 Velocity

24. 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.

Section: 03.02 Velocity

25. 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. 25 m/s^2
B. 36 m/s^2
C. 30 m/s^2
D. 21 m/s^2

Section: 03.02 Velocity

26. 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. 24 m/s^2

Section: 03.02 Velocity

27. 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

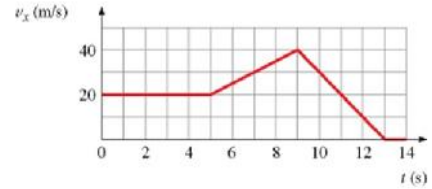
Section: 03.03 Newtons Second Law of Motion

28. 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

Section: 03.03 Newtons Second Law of Motion

29. The figure shows the graph of v_x versus time for an object moving along the x-axis. What is the acceleration at t = 7.0 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

Section: 03.03 Newtons Second Law of Motion

30. An object starts from rest with an acceleration of 2.0 m/s^2 for 3.0 seconds. It then reduces its acceleration to 1.0 m/s^2 for 5.0 additional seconds. The velocity at the end of the 5.0 seconds interval is
A. 6.0 m/s.
B. 18 m/s.
C. 8.0 m/s.
D. 18 m/s.
E. 11 m/s.

Section: 03.03 Newtons Second Law of Motion

31. An object starts from rest with an acceleration of 2.0 m/s^2 for 3.0 seconds. It then reduces its acceleration to 1.0 m/s^2 for 5.0 additional seconds. The total distance covered is
A. 52 m.
B. 38 m.
C. 11 m.
D. 9.0 m.
E. 7.6 m.

Section: 03.03 Newtons Second Law of Motion

32. 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

Section: 03.04 Applying Newtons Second Law

33. 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

Section: 03.04 Applying Newtons Second Law

34. 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.

Section: 03.04 Applying Newtons Second Law

35. 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.

Section: 03.04 Applying Newtons Second Law

36. 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.

Section: 03.04 Applying Newtons Second Law

37. 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.

Section: 03.04 Applying Newtons Second Law

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 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.

Section: 03.04 Applying Newtons Second Law

39. 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.

Section: 03.04 Applying Newtons Second Law

40. 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.

Section: 03.04 Applying Newtons Second Law

41. 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.

Section: 03.04 Applying Newtons Second Law

42. A car starts from rest and travels a distance of 100 m in 15 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.

Section: 03.04 Applying Newtons Second Law

43. 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.

Section: 03.04 Applying Newtons Second Law

44. 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.

Section: 03.04 Applying Newtons Second Law

45. An object starts from rest and moves with an acceleration of 2.0 m/s^2 for 3.0 seconds. It then reduces its acceleration to 1.0 m/s^2 for 5.0 additional seconds. The velocity 8 seconds from the start of the motion is
A. 51 m/s.
B. 38 m/s.
C. 11 m/s.
D. 9.0 m/s.
E. 7.6 m/s.

Section: 03.04 Applying Newtons Second Law

46. An object starts with an initial velocity of 4.0 m/s and accelerates with an acceleration of +4.0 m/s^2 for 6.0 seconds. It then decelerates at -2.0 m/s^2 until its velocity is 4.0 m/s. The total distance covered is
A. 67 m.
B. 194 m.
C. 105 m.
D. 288 m.
E. 215 m.

Section: 03.04 Applying Newtons Second Law

47. 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.

Section: 03.04 Applying Newtons Second Law

48. A 2.0 kg object is moving at a velocity of 12.0 m/s. The drag force 6.0 N. If the drag force is given by the equation $F = bv^2$, then the value of b is
A. 1.5×10^{-2} Ns^2/m^2.
B. 4.2×10^{-2} kg/m.
C. 3.9×10^{-1} kg/m^2.
D. 4.2×10^{-1} N/m^2.
E. 7.5×10^{-3} Ns^2/m^2.

Section: 03.04 Applying Newtons Second Law

49. A beetle runs an erratic pattern on a square kitchen table that is 1.5m on a side. The sides are arranged along the directions North/South and East/West. If he begins at the Southwest corner, and travels along one side to the adjacent corner in 20.0s. He then turns north, and reaches the Northeast corner 12.5s later. What is the magnitude of his average velocity for the whole trip?
A. 0.033 m/s
B. 0.065 m/s
C. 0.092 m/s
D. 0.098 m/s

Section: 03.02 Velocity

50. An ant crawls in a straight line at a constant speed of 0.24m/s, beginning in the corner of a square classroom, for 3.0m. It then turns exactly 90 degrees to the right, and proceeds an additional 4.0m with a constant speed of 0.44m/s, reaching the other corner of the same wall from which it began. What was the average speed for the full trip from corner to corner?
A. 0.32 m/s
B. 0.23 m/s
C. 0.30 m/s
D. 0.34 m/s
E. 0.21 m/s

Section: 03.02 Velocity

51. An ant crawls in a straight line at a constant speed of 0.24m/s, beginning in the corner of a square classroom, for 3.00m. It then turns exactly 90 degrees to the right, and proceeds an additional 4.00m, reaching the far corner of the same wall from which it began. If the second leg was also crawled in half the amount of time as required for the first leg, what was the ant's average speed for the whole trip?
A. 0.80 m/s
B. 0.27m/s
C. 0.37m/s
D. 0.44 m/s

Section: 03.02 Velocity

52. An ant crawls in a straight line at a constant speed of 0.35m/s, beginning in the corner of a square classroom that is 5.00m on a side. It first crosses the diagonal of the room, and then turns to the right, continuing at 0.45m/s to the far corner of the same wall from which it began. What was the ant's average speed for the whole trip?
A. 0.16 m/s
B. 0.40 m/s
C. 0.39 m/s
D. 0.24 m/s

Section: 03.02 Velocity

53. A baseball is pitched, reaching the batter with a speed of 37 m/s, and is hit, returning on the same line at 48 m/s. If the ball was in contact with the bat for 0.22 seconds, what was the average acceleration experienced by the ball during the time of contact?

A. 41 m/s^2
B. 220 m/s^2
C. 170 m/s^2
D. 390 m/s^2

Section: 03.03 Acceleration and Newton's Second Law of Motion

54. A 450g baseball is pitched, reaching the batter with a speed of 37 m/s, and is hit, returning on the same line at 48 m/s. If the ball was in contact with the bat for 0.22 seconds, what was the average net force experienced by the ball during the time of contact?

A. 98N
B. 170N
C. 18N
D. 77N

Section: 03.03 Acceleration and Newton's Second Law of Motion

55.

You drive your car 5.0 km due East at 35km/hr, and suddenly realize that you forgot your wallet. So, you return home, driving West at 40 km/hr, and upon arrival spend 10 minutes looking for it, and finally go back on the road for a total of 57.0 km due East. If your average speed was 40 km/hr for the whole journey, what was your average speed on your last leg?

A.
40 km/hr

B.
35 km/hr

C.
46 km/hr

D.
49 km/hr

Section: 03.02 Velocity

56.

The interstate on-ramp is 1.5 km West of your home, and on leaving for grandmother's house you are only able to accomplish an average velocity of 12 km/hr between your home and the on-ramp. At the onramp, you wait for traffic, for 2.0 min – and then are able to proceed toward grandmother's house. If you wish to arrive there, which is 15 km South of the on-ramp, over a river and through some woods, in a total elapsed time of 25.0 minutes, what average speed must you maintain on the interstate highway?

A. 36 km/hr
B. 67 km/hr
C. none of these.
D.
58 km/hr

Section: 03.02 Velocity

57.

The interstate on-ramp is 5.5 km West of your home, and on leaving for grandmother's house you are only able to accomplish an average velocity of 38 km/hr between your home and the on-ramp. At the onramp, you wait for traffic, for 2.0 min – and then are able to proceed toward grandmother's house. If you wish to arrive there, which is 15 km South of the on-ramp, over a river and through some woods, having achieved an average velocity of 42 km/hr, how fast do you need to drive south on the interstate highway?

A.
39 km/hr

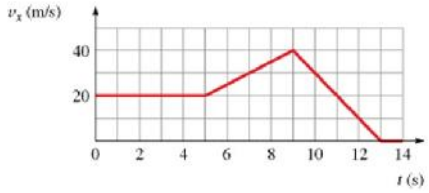
B.
58 km/hr

C.
48 km/hr

D.
78 km/hr

Section: 03.02 Velocity

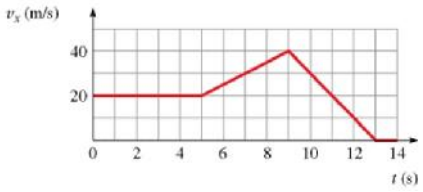
58. The figure shows the graph of v_x versus time for an object moving along the x-axis. Solve graphically for the distance traveled between t = 5.0 s and t = 9.0 s.



A. 110 m
B. 120 m
C. 100 m
D. 130 m

Chapter - pull fromChapter... #17
Section: 04.02 Kinematic Equations for Motion Along a Line with Constant Acceleration

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

Chapter - pull fromChapter... #18
Section: 04.02 Kinematic Equations for Motion Along a Line with Constant Acceleration

60. A rock is thrown straight up and 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

Chapter - pull fromChapter... #19
Section: 04.04 Free Fall

61. 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

Chapter - pull fromChapter... #20
Section: 04.04 Free Fall

62. 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

Chapter - pull fromChapter... #21
Section: 04.04 Free Fall

63. 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

Chapter - pull fromChapter... #22
Section: 04.04 Free Fall

64. 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

Chapter - pull fromChapter... #23
Section: 04.04 Free Fall

65. 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

Chapter - pull fromChapter... #24
Section: 04.04 Free Fall

66. 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. 45.9 m
D. 21.3 m

Chapter - pull fromChapter... #25
Section: 04.04 Free Fall

67. 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

Chapter - pull fromChapter... #26
Section: 04.04 Free Fall

68. Ball A is dropped from the top of a building. One second later ball B is dropped from the same point. As time progresses, the distance between them
A. increases.
B. decreases.
C. remains constant.
D. need more information

Chapter - pull fromChapter... #27
Section: 04.04 Free Fall

69. 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 and 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 - pull fromChapter... #28
Section: 04.04 Free Fall

70.

A sprinter runs 100.0 m in 9.87 seconds. If he travels at constant acceleration for the first 75.0 m, and then at constant velocity for the final 25.0 m, what was his acceleration during the first 75.0 m?

A. 1.58 m/s^2.
B. 2.05 m/s^2.
C. 2.10 m/s^2.
D. 2.74 m/s^2.

Chapter - pull fromChapter... #61
Section: 04.02 Kinematic Equations for Motion Along a Line with Constant Acceleration

71.

A sprinter runs 100.0 m. If he travels at constant acceleration of 1.95 m/s^2 for the first 75.0 m, and then at constant velocity for the remaining distance, what was his total elapsed time for the whole race?

A. 10.2 s.
B. 10.1 s
C. 11.3 s.
D. 9.8 s

Chapter - pull fromChapter... #62
Section: 04.02 Kinematic Equations for Motion Along a Line with Constant Acceleration

72.

A sprinter runs 100.0 m. If he travels at constant acceleration of 1.95 m/s^2 for the first 6.00 s, and then at constant velocity for the remaining time, what was his average velocity?

A. 9.9 m/s.
B. 10.2 m/s.
C.
8.7 m/s.

D. 9.8 m/s.

Chapter - pull fromChapter... #63
Section: 04.02 Kinematic Equations for Motion Along a Line with Constant Acceleration

73.

An electron travels under constant acceleration from a heated filament in an electron gun to the tip of the gun, where it is emitted. If the final speed of the electron is 1.5×10^5 m/s, and the length of the gun from filament to tip is 1.25 cm, what was the acceleration the electron underwent?

A. 9.0×10^{10} m/s^2
B. 1.8×10^9 m/s^2
C. 9.0×10^9 m/s^2
D. 1.8×10^{12} m/s^2
E. 6.0×10^6 m/s^2
F. 9.0×10^{11} m/s^2

Chapter - pull fromChapter... #64
Section: 04.02 Kinematic Equations for Motion Along a Line with Constant Acceleration

74.

A mouse is running away from a cat at 0.75 m/s, and, at 1.25 m from his mouse hole, he accelerates at a constant rate of 0.25 m/s^2 until he reaches his hole safely. How long a time was required for him to cover the last 1.25 m?

A.
1.4 s

B.
1.7 s

C.
1.2 s

D.
10 s

Chapter - pull fromChapter... #65
Section: 04.02 Kinematic Equations for Motion Along a Line with Constant Acceleration

75. A mouse is running away from a cat at 0.75m/s, and, at 1.25m from his mouse hole, he accelerates at a constant rate until he reaches his hole safely, 0.75s later. What acceleration did he undergo during the final 1.25m of his escape?
A. 6.4 m/s^2
B. 2.4 m/s^2
C. 1.8 m/s^2
D. 4.8 m/s^2
E. 1.2 m/s^2

Chapter - pull fromChapter... #66
Section: 04.02 Kinematic Equations for Motion Along a Line with Constant Acceleration

76. A model rocket flies upward at constant acceleration, and undergoes a displacement of 15.0m during its first 0.25s of travel. What was its speed at the end of the first 0.25s?
A. 120 m/s
B. 11 m/s
C. 30 m/s
D. 60 m/s

Chapter - pull fromChapter... #67
Section: 04.02 Kinematic Equations for Motion Along a Line with Constant Acceleration

77. A small golden statue falls from a height of 8.2m above the top surface of a pillow. If the acceleration of the statue, upon striking the pillow, is constant, what is the value of the acceleration if the pillow compresses by 3.9cm as the statue comes to rest?
A. 210 m/s^2
B. 2100 m/s^2
C. 21 m/s^2
D. 160 m/s^2

Chapter - pull fromChapter... #68
Section: 04.04 Free Fall

78. If a flea can jump up to 45cm above its initial resting point, with what speed is it able to leave the ground when jumping?
A. 4.2 m/s
B. 8.8 m/s
C. 3.0 m/s
D. 2.1 m/s

Chapter - pull fromChapter... #69
Section: 04.04 Free Fall

79. One stone is dropped from the side of a bridge, and a second is dropped from the same place a short time later. What is true about the distance between the stones as a function of time after both have been dropped? Ignore air resistance
A. Decreases, and then reaches a constant value
B. Increases, finally reaching a constant value
C. Always decreases
D. Always increases
E. Is constant

Chapter - pull fromChapter... #70
Section: 04.04 Free Fall

80. A ball is dropped at time t=0. At t=2.0s, a second ball is thrown downward with speed v. What is v if at t=4.0s, the two balls are at the same vertical position?
A. 49 m/s
B. 25 m/s
C. 29 m/s
D. 15 m/s

Chapter - pull fromChapter... #71
Section: 04.04 Free Fall

81.

A baseball is struck by a batter at an angle such that it reaches its maximum height at the location of the pitcher – and just grazes the top of the pitcher's head (at an elevation of 1.50 m above the launch point of the baseball). The pitcher is a horizontal distance of 20.0 m from the point at which the ball was struck. What was the launch angle for the baseball?

A.
10.6°

B.
17.4°

C.
8.53°

D.
16.7°

E.
4.29°

F.
4.31°

Chapter - pull fromChapter... #76
Section: 04.05 Motion of Projectiles

82.

A baseball is struck by a batter at an angle such that it reaches its maximum height at the location of the pitcher – and just grazes the top of the pitcher's head (at an elevation of 1.50m above the launch point of the baseball). The pitcher is a horizontal distance of 20.0 m from the point at which the ball was struck. What was the launch speed for the baseball?

A. 37 m/s
B.
36 m/s

C.
51 m/s

D.
27 m/s

Chapter - pull fromChapter... #77
Section: 04.05 Motion of Projectiles

Chapter 2 Test Bank - Motion Along a Line Summary

Category	*# of Questions*
Chapter - pull fromChapter...	25
Section: 03.01 Position and Displacement	20
Section: 03.02 Velocity	13
Section: 03.03 Acceleration and Newton's Second Law of Motion	2
Section: 03.03 Newtons Second Law of Motion	5
Section: 03.04 Applying Newtons Second Law	17
Section: 04.02 Kinematic Equations for Motion Along a Line with Constant Acceleration	9
Section: 04.04 Free Fall	14
Section: 04.05 Motion of Projectiles	2