

5. -/2.35 pointsOSColPhys1 1.3.023.

If a marathon runner averages 9.3 mi/h, how long does it take him or her to run a 26.22-mi marathon?

h

Additional Materials

- [Reading](#)

6. -/2.35 pointsOSColPhys1 1.4.030.

A generation is about one-third of a lifetime. Approximately how many generations have passed since the beginning of recorded history?

generations

Additional Materials

- [Reading](#)

7. -/2.35 pointsOSColPhys1 2.1.001.

Find the following for path D in Figure 2.21.

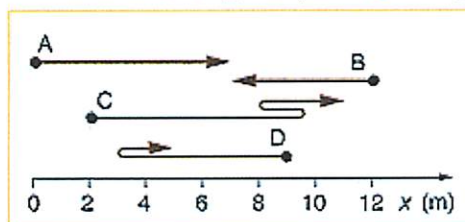


Figure 1-21.

(a) the total distance traveled

m

(b) the distance from start to finish

m

(c) the displacement from start to finish

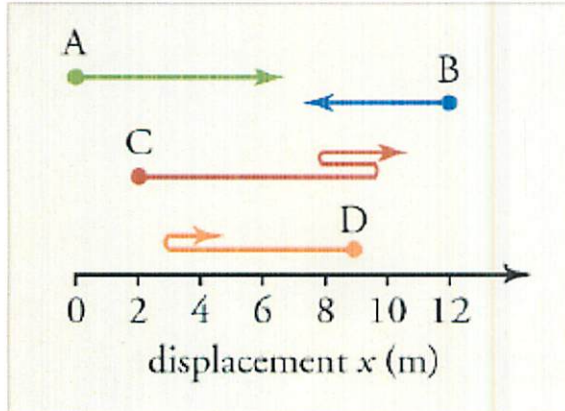
m

Additional Materials

- [Reading](#)

8. -/2.35 pointsOSColPhys1 2.1.002.

Find the following for path D in the figure below.



(a) The distance traveled.

m

(b) The magnitude of the displacement from start to finish.

m

(c) The displacement from start to finish.

m

Additional Materials

- [Reading](#)

9. -/2.35 pointsOSColPhys1 2.3.009.

On May 26, 1934, a streamlined, stainless steel diesel train called the Zephyr set the world's nonstop long-distance speed record for trains. Its run from Denver to Chicago took 13 hours, 4 minutes, 58 seconds, and was witnessed by more than a million people along the route. The total distance traveled was 1633.8 km. What was its average speed in km/h?

km/h

What was its average speed in m/s?

m/s

Additional Materials

- [Reading](#)

10.-/2.35 pointsOSColPhys1 2.3.011.

A student drove to the university from her home and noted that the odometer on her car increased by 15.0 km. The trip took 20.0 min.

(a) What was her average speed?

km/h

(b) If the straight-line distance from her home to the university is 10.3 km in a direction 25.0° south of east, what was her average velocity?

km/h (25° S of E)

(c) If she returned home by the same path 7 h 30 min after she left, what were her average speed and velocity for the entire trip?

average speed

km/h

average velocity

km/h

Additional Materials

- [Reading](#)

11.-/2.35 pointsOSColPhys1 2.4.016.

A cheetah can accelerate from rest to a speed of 23.0 m/s in 4.50 s. What is its acceleration?

m/s²

Additional Materials

- [Reading](#)

12.-/2.35 pointsOSColPhys1 2.4.019.

Assume that an MX missile goes from rest to a suborbital velocity of 8.50 km/s in 70.0 s (the actual speed and time are classified). What is its average acceleration in m/s²?

m/s²

What is its average acceleration in multiples of g ?

g

Additional Materials

- [Reading](#)

13.-/2.35 pointsOSColPhys1 2.5.024.

At the end of a race a runner decelerates from a velocity of 7.00 m/s at a rate of 0.500 m/s².

(a) How far does she travel in the next 16.0 s?

m

(b) What is her final velocity?

m/s

Additional Materials

- [Reading](#)

14.-/2.35 pointsOSColPhys1 2.5.033.

An unwary football player collides with a padded goalpost while running at a velocity of 5.50 m/s and comes to a full stop after compressing the padding and his body 0.250 m.

(a) How long does the collision last?

s

(b) What is his deceleration?

m/s²

Additional Materials

- [Reading](#)

15.-/2.35 pointsOSColPhys1 2.7.046.

A swimmer bounces straight up from a diving board and falls feet first into a pool. She starts with a velocity of 4.00 m/s, and her takeoff point is 1.30 m above the pool.

(a) How long are her feet in the air?

s

(b) What is her highest point above the board?

m

(c) What is her velocity when her feet hit the water?

m/s

Additional Materials

- [Reading](#)

16. -/2.35 points OSColPhys1 2.7.058.

A soft tennis ball is dropped onto a hard floor from a height of 1.80 m and rebounds to a height of 1.43 m. (Assume that the positive direction is upward.)

(a) Calculate its velocity just before it strikes the floor.

m/s

(b) Calculate its velocity just after it leaves the floor on its way back up.

m/s

(c) Calculate its acceleration during contact with the floor if that contact lasts 3.50 ms.

m/s^2

(d) How much did the ball compress during its collision with the floor, assuming the floor is absolutely rigid?

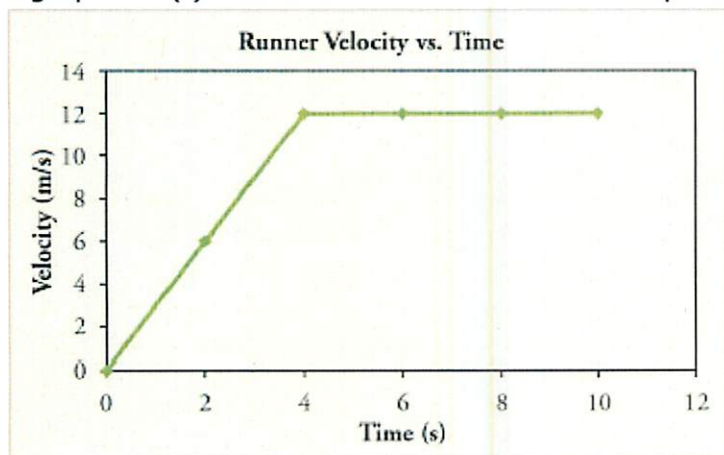
m

Additional Materials

- [Reading](#)

17.-/2.4 pointsOSColPhys1 2.8.065.

A graph of $v(t)$ is shown for a world-class track sprinter in a 100-m race. (See figure below).



(a) What is his average velocity for the first 4 s?

m/s

(b) What is his instantaneous velocity at $t = 8$ s?

m/s

(c) What is his average acceleration between 0 and 4 s?

m/s^2

(d) What is his time for the race?

s

Additional Materials

- [Reading](#)