$$
\begin{aligned}
v &= v_0 + at \\
x &= x_0 + v_0 t + \tfrac{1}{2} a t^2 \\
v^2 &= v_0^2 + 2a(x - x_0) \\
\bar{v} &= \frac{v + v_0}{2}.
\end{aligned}
$$

ISM Physics 1 Periodic 1 2022

Name_____

Please use 10 m/s/s for g.

Questions 1 - 4

A car drives 6 miles east and then drives 8 miles north. The drive took 10 minutes.

1. What distance did the car travel?
   a. 10 miles b. 14 mic. 7 miles d. zero miles

2. What is the car's displacement?
   a. 10 miles b. 14 mic. 7 miles d. zero miles

3. What is the car's average speed?
   a. 1.4 mi/min b. 1 mi/min c. 8 mi/min d. zero mi/min

4. What is the car's average velocity?
   a. 1.4 mi/min b. 1 mi/min c. 8 mi/min d. zero mi/min

Questions 5 – 10

A ball is released from rest from a position 80 m above the ground.

5. What is the ball's speed after falling 2 seconds?
   a. 2 m/s b. 10 m/s c. 20 m/s d. none of these

6. What is the ball's acceleration after 3 seconds?
   a. 3 m/s/s b. 6 m/s/s c. 10 m/s/s d. none of these

7. How far does the ball fall during the 1st second?
   a. 5 m b. 10 m c. 15 m d. 20 m

8. How far does the ball fall during the 2nd second?
   a. 2 m d. 5 m c. 15 m d. 20 m

9. How long does it take the ball to reach the ground?
   a. 3 s b. 4 s c. 8 seconds d. none of these

10. What is the ball's speed just before it lands?
    a. 10 m/s b. 20 m/s c. 30 m/s d. 40 m/s

Questions 11 – 12

An airplane at rest begins to accelerate on a runway with an acceleration of 4 m/s/s.
The minimum speed for take off is about 80 m/s.

11. What is the minimum length of the runway?
    a. 110 m b. 210 m c. 320 m d. 800 m e. none of these

12. How long does the plane take to leave the ground?
    a. 10 s b. 20 s c. 80 s d. 100 s e. none of these

Questions 13 – 15

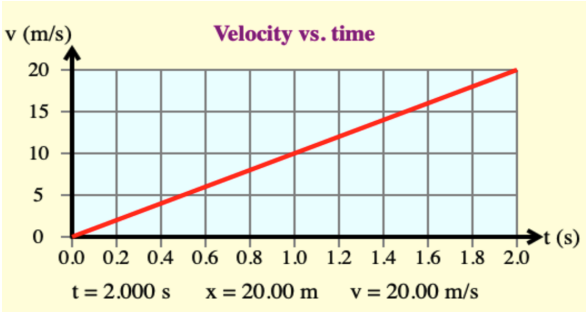
A ball is thrown strait up in the air with an initial speed of 10 m/s.

13. How high does the ball rise?
    a. 5 m b. 10 m c. 20 m d. 45 m e. none of these

14. If you catch the ball at the same height from which it was thrown, what total time was the ball in the air?
    1. 1 s b. 2 s c. 4 s d. 5 s e. none of these

15. What is the magnitude of the ball's acceleration when it reaches its highest position?
    a. zero m/s/s b. 5 m/s/s c. 10 m/s/s d. 20 m/s/s e. none of these

Questions 16 - 18



The graph above is a velocity vs. time graph for an object moving with uniform acceleration.

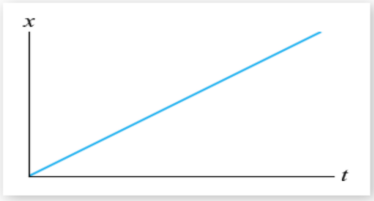
16. What is this object's acceleration?
    a. zero m/s/s b. 10 m/s/s c. 20 m/s/s d. none of these

17. How far has this object moved during the 2 seconds shown?
    a. 5 m b. 10 m c. 20 m d. 40 m

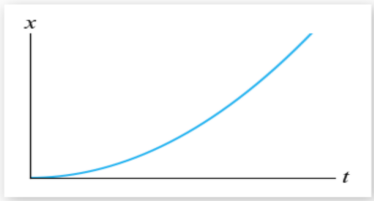
18. What is this objects average velocity for this 2 second interval?
    a. zero m/s b. 5 m/s c. 10 m/s d. 20 m/s

19. A car that is initially moving in the positive direction, slows down and stops. Which of the graphs below best describes this motion?

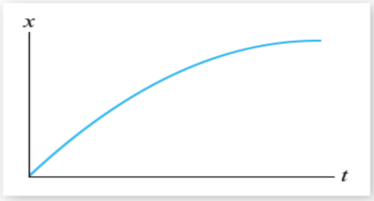
a.



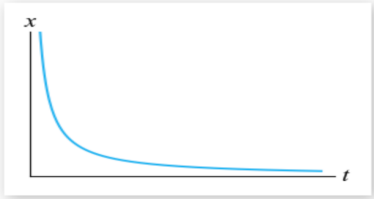
b.



c.

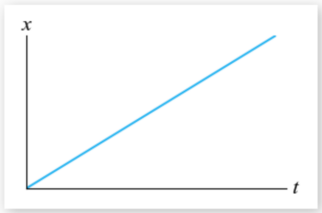


d.

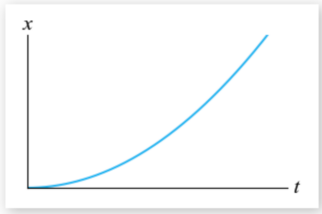


20. Which graph best represents an object moving with constant velocity?

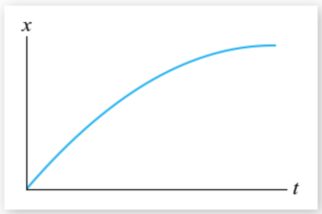
a.



b.



c.



d.