

1. 1 mi is equivalent to 1609 m so 55 mi/h is:

- a) 15 m/s b) 25 m/s c) 66 m/s d) 88 m/s

2. The SI base unit for mass is:

- a) gram b) pound c) kilogram d) kilopound

3. A nanosecond is:

- a) 10^9 s b) 10^{-9} s c) 10^{-10} s

4. Complete the following statement: Displacement is

- a) a scalar that indicates the distance between two points.
b) a vector indicating the distance and direction from one point to another.
c) a measure of volume.
d) the same as the distance traveled between two points.

5. The coordinate of a particle in meters is given by $x(t) = 16t - 3t^3$, where the time t is in seconds. The particle is momentarily at rest at $t =$

- a) 0.75 s b) 1.3 s c) 5.3 s d) 7.3 s

6. An object moves horizontally with a constant acceleration. At time $t = 0$ s, the object is at $x = 0$ m. for which of the following combination of the initial velocity and acceleration of the object will be $x = -1.5$ m at time $t = 3$ s?

- a) $v_0 = +2$ m/s, $a = +2$ m/s² b) $v_0 = -2$ m/s, $a = +2$ m/s² c) $v_0 = +2$ m/s, $a = -2$ m/s²
d) $v_0 = 1$ m/s, $a = -1$ m/s²

7. An object dropped from the window of a tall building hits the ground in 12s. The height of the window above the ground is:

- a) 29.4 m b) 58.8 m c) 118 m d) 706 m

8. A delivery truck leaves a warehouse and travels 2.60 km north. The truck makes a right turn and travels 1.33 km east before making another right turn and then travels 1.45 km south to arrive at its destination. Express the displacement of the truck from the warehouse using unit vectors

- a) $\vec{d} = 1.33\hat{i} + 1.45\hat{j}$ b) $\vec{d} = 1.33\hat{i} + 1.15\hat{j}$
c) $\vec{d} = 1.15\hat{i} + 1.33\hat{j}$ d) $\vec{d} = 1.33\hat{i} + 2.60\hat{j}$

9. The value of $\hat{k} \cdot (\hat{k} \times \hat{i})$ is

- a) zero b) +1 c) -1 d) $\sqrt{3}$

10. In the diagram, \vec{A} has magnitude 12 and \vec{B} has magnitude 8. The x component of $\vec{A} + \vec{B}$ is

- a) 5.5 m b) 7 c) 12.5 d) 14

