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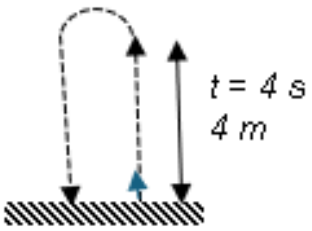
Take g = 9.8 ms^{-2} wherever needed

Q	Multiple choice questions
1	If the change of position x of a train is given by $x = \frac{1}{2}at^2 + bt^3$ (where a is the acceleration, t is time). The dimension of b is: A) LT^{-3} B) LT^{-1} C) LT^{-2} D) LT^3
2	A particle is moving in a straight line according to the equation: $x(t) = 4 + 2t^2 - t^3$ (m). Its acceleration (in units of m/s^2) at (t=2 s) is: A) -4 m/s^2 B) -8 m/s^2 C) 4 m/s^2 D) -12 m/s^2
3	An electron, starting from rest and moving with a constant acceleration, travels 2.0 cm in 5.0 ms. What is the magnitude of this acceleration? A) 2.5 km/s^2 B) 0.80 km/s^2 C) 1.6 km/s^2 D) 1.3 km/s^2
4	A stone dropped down a well accelerates with a constant value of g = 10 m/s^2 and hits the bottom after time t = 3.0 s. The depth of the well is closest to... A) 15 m B) 30 m C) 45 m D) 90 m
5	A ball is thrown straight up. When the ball reached its maximum height, which of the following statements is not true for the ball: A) its acceleration is not zero B) its acceleration is zero C) its final speed is zero D) its initial speed is not zero
6	A ball is thrown vertically upward and is caught 4 s later by someone at 4 m above the ground while it is going in the upward direction. The initial velocity of the object is :  A)16 m/s B)12 m/s C)8 m/s D) 21m/s

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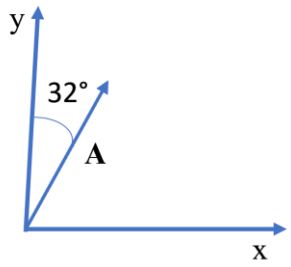
7

Vector **A** has y-component $\mathbf{A_y} = +\mathbf{13\ m}$.

A makes an angle of **32°** with the positive y-axis (See Figure).



The x-component A_x of **A** is:

A) -8.1 m B) 6.5 m C) 8.1 m D) 20.8 m

8

If $\vec{A} = 5\hat{i} - 6\hat{j}$ and $\vec{B} = -3\hat{i} + 2\hat{j}$ are two vectors. The magnitude of the vector $\vec{C} = \vec{A} - 2\vec{B}$ is:

A) 13.0 B) 11.2 C) 10.0 D) 14.9

9

A particle started its motion from rest at the point ($\mathbf{r_0}$ = - 3**i** + 2**j**) m with an acceleration given by: **a** = 6**i** – 4**j**. Its Position ($\mathbf{r_f}$), after 2 seconds is:

A) $\mathbf{r_f}$ = 3i – 2j m B) $\mathbf{r_f}$ = 9i – 6j m C) $\mathbf{r_f}$ = 12i -10j m D) $\mathbf{r_f}$ = 15i – 12j m

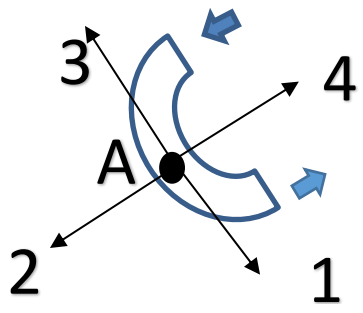
10

A football is kicked at an angle of 45° and hits the ground 80 meters from the kick point. What was the initial velocity?

A) 10 m/s B) 15 m/s C) 28 m/s D) 32 m/s

11

A car travels at constant speed along the curved path shown from above in Figure. Which vector best represents the car's acceleration at position A?



A) 4 B) 3 C) 2 D) 1

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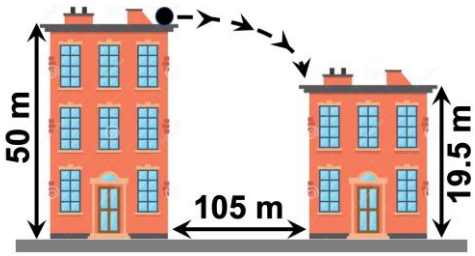
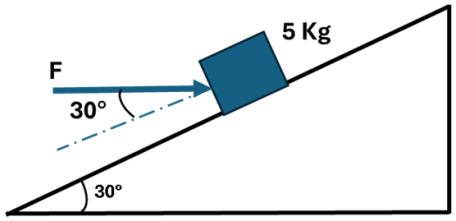
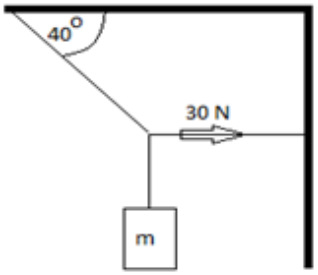
12	A small stone has been thrown horizontally from a top of 50 meters high to the roof of another building of 19.5 meters high from the ground. If the shorter building is 105 meters away (horizontally) from the taller one, the initial speed of the stone is:  A) 105 m/s B) 54 m/s C) 16 m/s D) 42 m/s
13	In the case of the elevator moving downwards, the apparent weight of the object is ..... the real weight. A) Greater than B) Less than C) Twice D) Equal to
14	A force of 50 Newtons was applied to push a box of mass 5 kg up a rough, sloping surface with an angle of inclination of 30°. If the box moved at a constant speed a distance of 5 meters on the inclined surface, calculate the coefficient of friction between the body and the inclined surface.  A) 0.13 B) 0.28 C) 0.36 m D) 0.29
15	Calculate the amount of suspended mass in the figure, given that the tension in the horizontal rope is 30 N and the angle of inclination of the inclined rope with the horizontal is 40°.  A) 25.17 Kg B) 39.16 Kg C) 2.57 Kg D) 5.57 Kg

The End