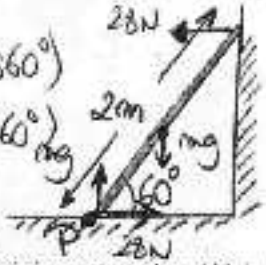
6) A 2 m ladder rests against a frictionless wall with an angle of 60° with respect to the horizontal. If the normal force that the wall exerts on the ladder is 28 N, what is the approximate mass of the ladder?

a) 5 kg
b) 8 kg
c) 15 kg
d) 20 kg
e) 25 kg

$\tau_P = -mg(1m)(\cos 60°) + (28\,N)(2m)(\sin 60°) = 0$

$\rightarrow m \approx 10kg$




7) A 1 kg particle moves according to a simple harmonic motion which is described by its horizontal position as:

$$x(t) = 3\cos\left(\pi t - \frac{\pi}{2}\right)\ [m]$$

The period of this motion is:

a) 1 s
b) 2 s
c) 3 s
d) 4 s
e) 5 s

$\omega = \pi$

$T = \frac{2\pi}{\omega} \rightarrow T = 2s$

8) A 4 kg-particle moves according to a simple harmonic motion which is described by its horizontal position as:

$$x(t) = 3\sin(\pi t)\ [m]$$

The initial phase of this motion is:

a) 0 rad
b) $\pi$ rad
c) $\pi/2$ rad
d) $-\pi/4$ rad
e) $-\pi/2$ rad

$x(t) = 3\sin(\pi t) = 3\cos\left[\pi t - \frac{\pi}{2}\right]$

$\rightarrow \delta = -\frac{\pi}{2}$