(ii) Motion of wedge:

$u = 0, \quad s = 1, \quad a = \frac{3g}{16},$

$\Rightarrow s = ut + \frac{1}{2}at^2$

$\Rightarrow 1 = \frac{1}{2}\left(\frac{3g}{16}\right)t^2$

$\Rightarrow \frac{3gt^2}{32} = 1$

$t = \sqrt{\frac{32}{3g}}$ s

Motion of particle relative to wedge:

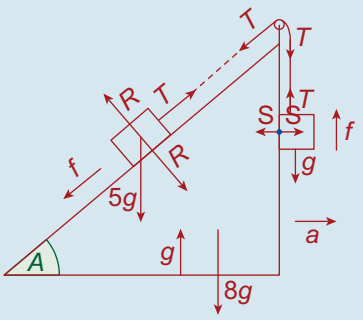
$u = 0, \quad t = \sqrt{\frac{32}{3g}}, \quad f = \frac{3g}{4}$

$s = ut + \frac{1}{2}ft^2$

$= \frac{1}{2}\left(\frac{3g}{4}\right)\left(\frac{32}{3g}\right)$

$= 4$ m

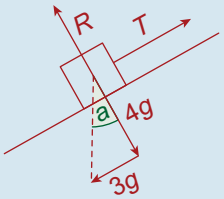
Q. 9.



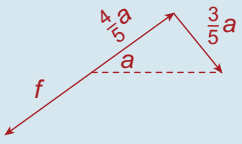
Since $\tan A = \frac{3}{4}$, $\sin A = \frac{3}{5}$, $\cos A = \frac{4}{5}$

The 5kg Mass:

Forces



Acceleration



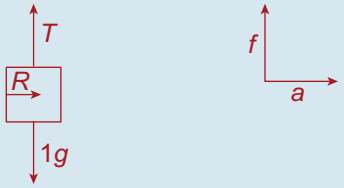
(i) Along the plane: $3g - T = 5\left(f - \frac{4}{5}a\right)$

(ii) Perpendicular to the plane

$4g - R = 5\left(\frac{3}{5}a\right)$

The 1kg Mass:

Forces **Acceleration:**

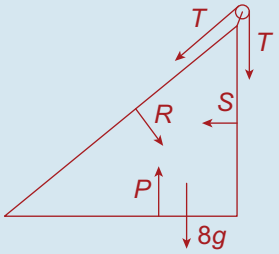


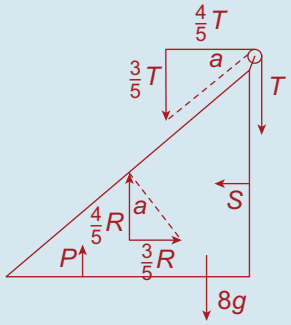
(iii) Along the vertical : $T - g = f$

(iv) Along the horizontal: $S = a$

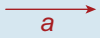
The Wedge:

Forces



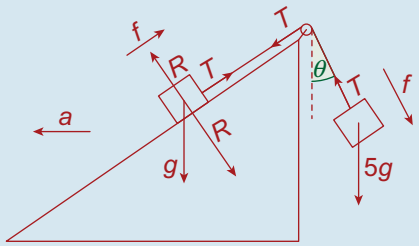


Acceleration



(v) $\frac{3}{5}R - \frac{4}{5}T - S = 8a$

Q. 10.



The 1kg Mass:

Forces