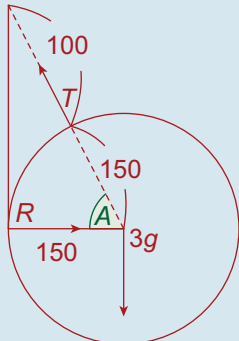


(iii) (1) $\frac{3}{5}R = W \Rightarrow R = \frac{5}{3}W$
 (2) $F = \frac{4}{5}R = \frac{4}{5}(\frac{5}{3}W) = \frac{4}{3}W$

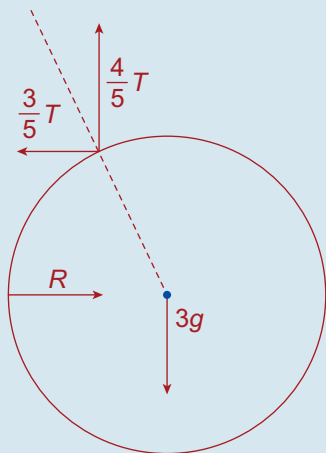
Q. 5. (a) Forces:



$$\cos A = \frac{150}{250} = \frac{3}{5}$$

$$\therefore \sin A = \frac{4}{5}$$

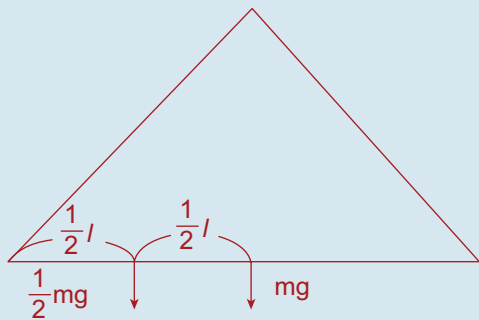
Resolved Forces:



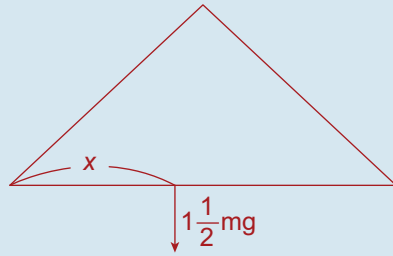
$$(1) \frac{4}{5}T = 3g \Rightarrow T = \frac{15}{4}g$$

Q. 6. Step 1. To find centre of gravity:

Forces:



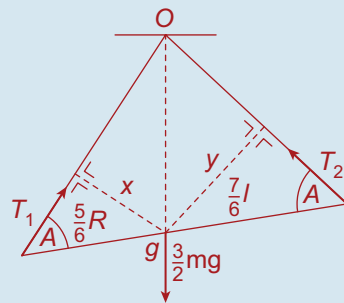
Resultant:



The sum of the moment = the moment of the sum

$$\frac{1}{2}mg\left(\frac{1}{2}l\right) + mg(l) = 1\frac{1}{2}mg(x)$$

$$\Rightarrow x = \frac{5}{6}l$$



The resultant weight, $\frac{3}{2}mg$ acts through g , which must be below O in accordance with Theorem 8.7

Taking moments about g :

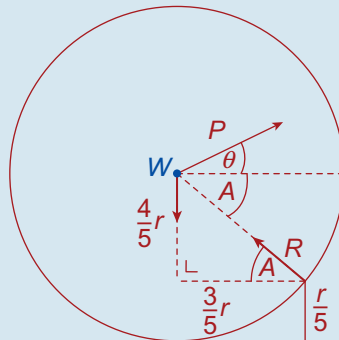
$$T_1(x) = T_2(y)$$

$$\text{But } x = \frac{5}{6}l \sin A, y = \frac{7}{6}l \sin A$$

$$\therefore T_1\left(\frac{5}{6}l \sin A\right) = T_2\left(\frac{7}{6}l \sin A\right)$$

$$\Rightarrow \frac{T_1}{T_2} = \frac{7}{5}$$

Q. 7.



$$\sin A = \frac{4}{5}$$

$$\therefore \cos A = \frac{3}{5}$$