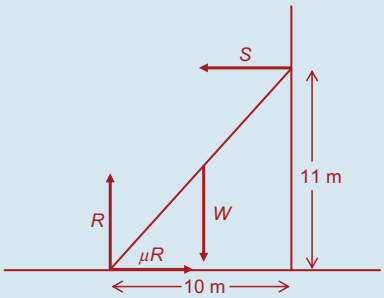
③ $W(2) = S(6)$

$\Rightarrow S = \frac{1}{3}W$

(ii) ② $\mu W = \frac{1}{3}W$

$\Rightarrow \mu = \frac{1}{3}$

Q. 5.



① $R = W$

② $\mu R = S$

③ $W(5) = S(11) \Rightarrow S = \frac{5}{11}W$

② $\mu W = \frac{5}{11}W \Rightarrow \mu = \frac{5}{11}$

Q. 6. (a) (i) Friction

(ii) Moment

(b) ① $R = 245$

② $0.8R = S$

③ $245\ (a \cos \alpha) = S(2a \sin \alpha)$

Equation ②

$\Rightarrow S = 0.8(245) = 196$

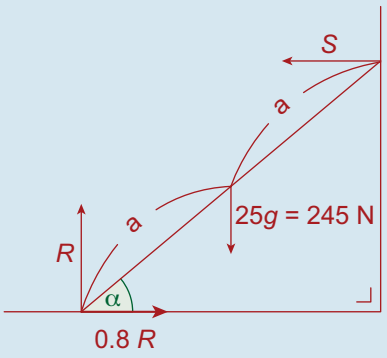
Equation ③

$\Rightarrow 245 \cos \alpha = (196)2 \sin \alpha$

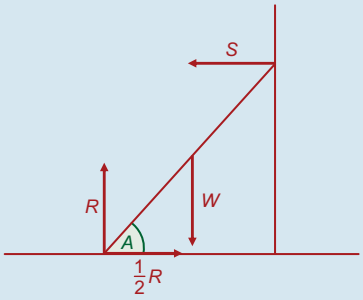
$\Rightarrow 245 = 392 \tan \alpha$

$\Rightarrow \tan \alpha = \frac{245}{392}$

$= \frac{5}{8}$



Q. 7.



Let the ladder have a length of $2l$.

① $R = W$

② $\frac{1}{2}R = S$

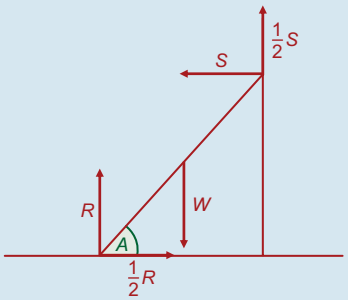
③ $W(l \cos A) = S(2l \sin A)$

$\Rightarrow S = \frac{W \cos A}{2 \sin A} = \frac{W}{2 \tan A}$

② $\frac{1}{2}W = \frac{W}{2 \tan A} \Rightarrow \tan A = 1$

$\Rightarrow A = 45°$.

Q. 8.



Let the ladder have a length of $2l$.

① $R + \frac{1}{2}S = W \Rightarrow R = W - \frac{1}{2}S$

② $\frac{1}{2}R = S$

③ $W(l \cos A) = S(2l \sin A) + \frac{1}{2}S(2l \cos A)$

… divide by $l \cos A$

$\Rightarrow W = 2S \tan A + S$

$\Rightarrow S(2 \tan A + 1) = W$

$\Rightarrow S = \frac{W}{2 \tan A + 1}$

② $\frac{1}{2}\left(W - \frac{1}{2}S\right) = S$

$\Rightarrow \frac{1}{2}W - \frac{1}{4}S = S \Rightarrow 2W - S = 4S$

$\Rightarrow 2W = 5S$

$\Rightarrow 2W = \frac{5W}{2 \tan A + 1}$

$\Rightarrow 2 \tan A + 1 = \frac{5}{2}$

$\Rightarrow \tan A = \frac{3}{4} \Rightarrow A = 37°$