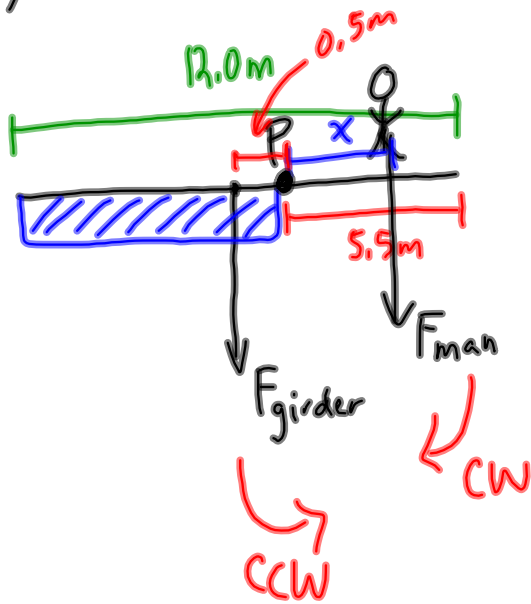


FOP (96-3)

2.

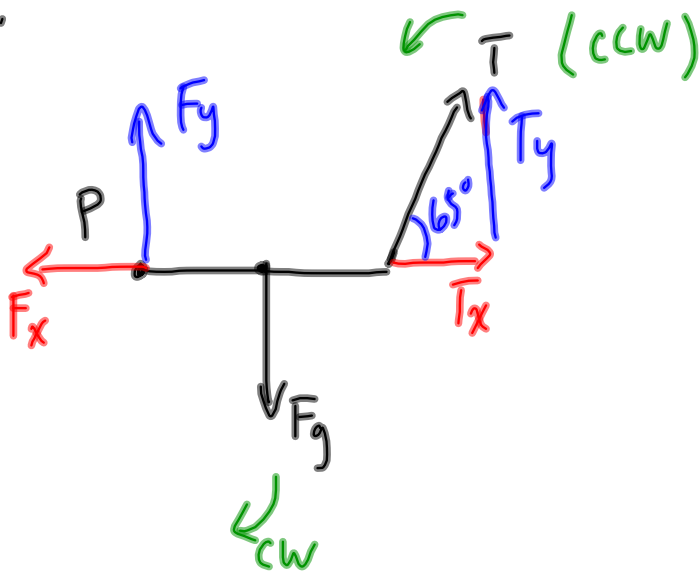


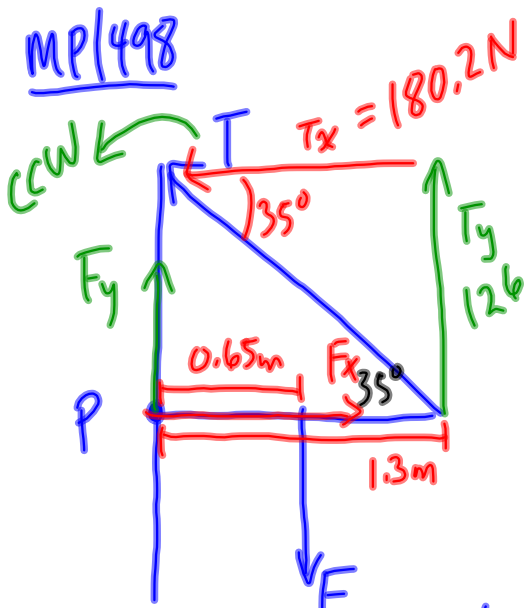
$$\sum \tau_{ccw} = \sum \tau_{cw}$$

$$\tau_{girder} = \tau_{man}$$

$$(0.5m) F_{girder} = x F_{man}$$

4.





$$\sum \tau_{ccw} = \sum \tau_{cw}$$

$$\tau_T = \tau_{sign+rod}$$

$$(1.3m) T \sin 35^\circ = (0.65m) (253.098N)$$

$$T = \frac{(0.65m)(253.098N)}{(1.3m) \sin 35^\circ}$$

$$F_{sign+rod} = (18kg + 7.8kg)(9.81m/s^2) = 253.098N$$

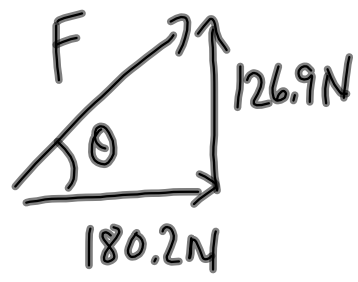
$\bar{T} = 220N$

Horizontally:  $\bar{F}_x = \bar{T}_x = 180.2N$

Vertically:  $\bar{F}_y + \bar{T}_y = \bar{F}_{sign+rod}$

$$\bar{F}_y = 253.098N - 126.2N$$

$$\bar{F}_y = 126.9N$$



ours are off due to rounding

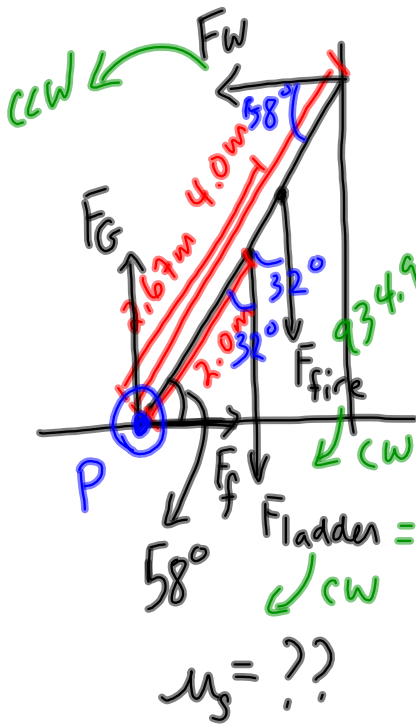
$F_y = T_y$

in this case ONLY

$$\vec{F} = 220N [35^\circ \text{ above horizontal}]$$

↑ matches the tension due to the symmetry.

MP/496



Choose the bottom of the ladder as pivot

$$\sum \tau_{ccw} = \sum \tau_{cw}$$

$$\tau_w = \tau_{ladder} + \tau_{fire}$$

$$(4.0m) F_w (\sin 58^\circ) = (2.0m) (343.35N) \sin 32^\circ + (2.67m) (934.95N) \sin 32^\circ$$

$$(4.0m) F_w (\sin 58^\circ) = 363.896N + 1322.85N$$

$$(4.0m) F_w (\sin 58^\circ) = 1686.742N$$

$$F_w = 497N$$

Horizontally:  $F_f = F_w = 497N$

Vertically:  $F_N = F_{ladder} + F_{fire} = 1278.3 (F_N)$

$$\mu = \frac{F_f}{F_N} = \frac{497N}{1278.3N} = 0.39$$

TO DO:

① PP/501 ← ✓

② FOP/6-3/5,6+7 (can start on these)