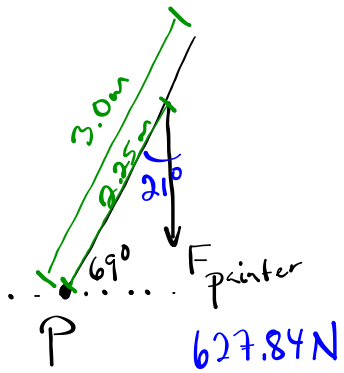
PP/495

30.



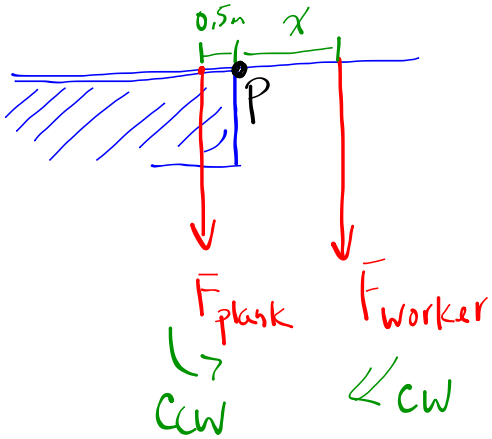

$\tau = rF\sin\theta$

$\tau = (2.25\text{m})(627.84\text{N})\sin 21^\circ$

$\tau = 5.1 \times 10^2\ \text{N}\cdot\text{m}$

FOP/86-3

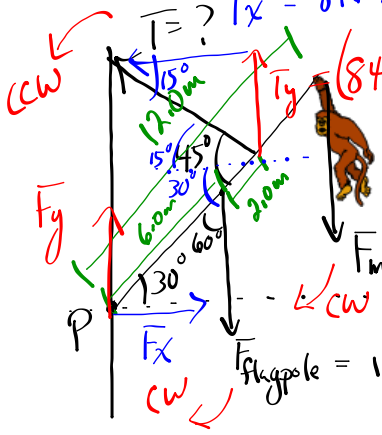
2.




$\Sigma\tau_{CCW} = \Sigma\tau_{CW}$

$\tau_{plank} = \tau_{worker}$

# Monkey on Flagpole




$\Sigma\tau_{CCW} = \Sigma\tau_{CW}$

$\tau_T = \tau_{flagpole} + \tau_{monkey}$

$m_{flagpole} = 16.3\,kg$

$m_{monkey} = 38.8\,kg$

$T = ?$

$F_x$ and $F_y$ at = ? the wall where the flagpole is attached

$\tau_{flagpole} = rF\sin\theta$

$\tau_{flagpole} = (6.0m)(159.903N)\sin 60°$

$\tau_{flagpole} = 830.880\,N\cdot m$

$\tau_{monkey} = rF\sin\theta$

$\tau_{monkey} = (12.0m)(380.628N)\sin 60°$

$\tau_{monkey} = 3955.602\,N\cdot m$

$\tau_T = \tau_{flagpole} = \tau_{monkey}$

$T(8.0m)(\sin 45°) = 830.880\,N\cdot m + 3955.602\,N\cdot m$

$T = 846.139\,N$ $8.5\times10^2\,N$

## Horizontally

$F_x = T_x$

$F_x = 817.307\,N$

$F_x = 8.2\times10^2\,N$

## Vertically

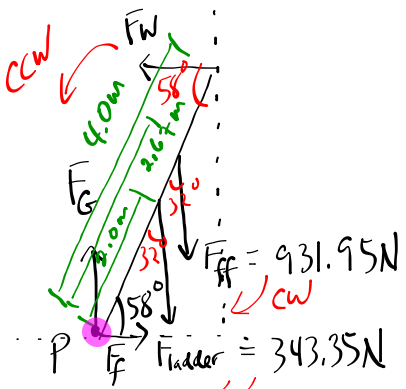
$T_y + F_y = F_{monkey} + F_{flagpole}$

$F_y = 380.628N + 156.903N - 218.997N$

$F_y = 318.534\,N$

$F_y = 3.2\times10^2\,N$

MP|496




$m_{ff} = 95kg$

$m_{ladder} = 35kg$

Arbitrarily choose the base of the ladder as your pivot point.

$$\Sigma\tau_{CCW} = \Sigma\tau_{CW}$$

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

$$F_w(4.0m)\sin 58^\circ = (2.0m)(343.35N)\sin 32^\circ + (2.67m)(931.95N)\sin 32^\circ$$

$$F_w(4.0m)\sin 58^\circ = 363.896N\cdot m + 1318.602N\cdot m$$

$$F_w = \frac{1682.498N\cdot m}{(4.0m)(\sin 58^\circ)}$$

$$F_w = 495.99N$$

$$F_w = 5.0\times10^2 N$$

Horizontally

$$F_f = F_w$$

$$F_f = 495.99N$$

Vertically

$$F_G = F_{ff} + F_{ladder}$$

$$F_G = 931.95N + 343.35N$$

$$F_G = 1275.3N$$

← normal force at base of ladder

$$\mu = \frac{F_f}{F_N}$$

$$\mu = \frac{495.99N}{1275.3N}$$

$$\mu = 0.39$$

TO DO

① PP|501

② FOP|PP|5-7 (§6-3)