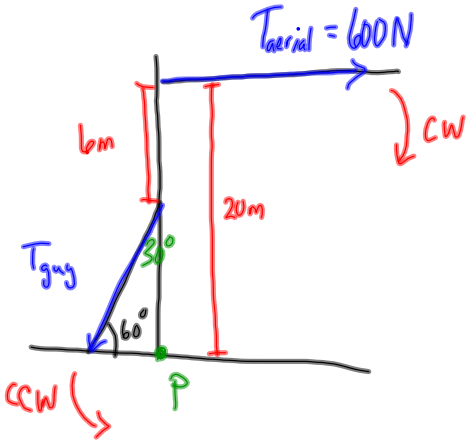
FOP | §6-3

3.



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

$\tau_{guy} = \tau_{aerial}$

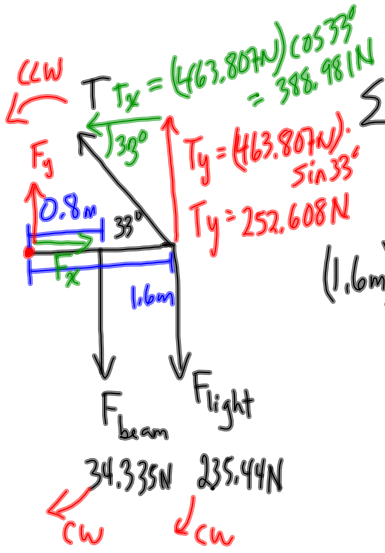
$(14m) T_{guy} \sin 30° = (20m)(600N)$

$T_{guy} = \frac{(20m)(600N)}{(14m)(\sin 30°)}$

$T_{guy} \doteq 1.7 \times 10^3 N$

PP | 501

33.



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

$\tau_T = \tau_{beam} + \tau_{light}$

$(1.6m) T (\sin 33°) = (0.8m)(34.335N) + (1.6m)(235.44N)$

$T = \frac{27.468 + 376.704 N \cdot m}{(1.6m)(\sin 33°)}$

$T = 463.807 N$

$T \doteq 4.6 \times 10^2 N$

Horizontally:

$F_x = T_x$

$F_x = 388.981 N$

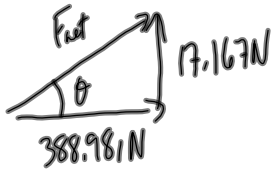
Vertically:

$F_y + T_y = F_{beam} + F_{light}$

$F_y = F_{beam} + F_{light} - T_y$

$F_y = 34.335N + 235.44N - 252.608N$

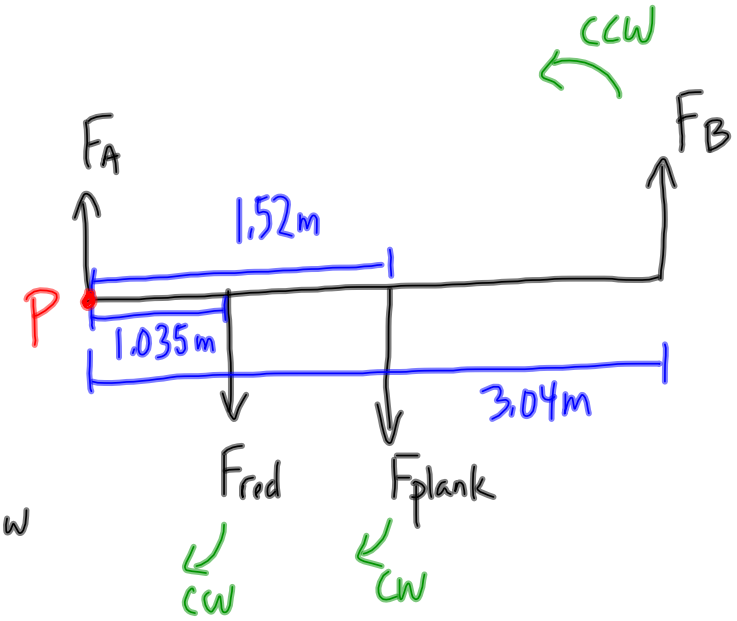
$F_y = 17.167N$



A Bridge Problem

$F_{red} = 620N$

$F_{plank} = 170N$



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

$$\tau_B = \tau_{red} + \tau_{plank}$$

$$(3.04m)F_B = (1.035m)(620N) + (1.52m)(170N)$$

$$F_B = \frac{641.7N\cdot m + 258.4N\cdot m}{3.04m}$$

$F_B = 296N$ 285N

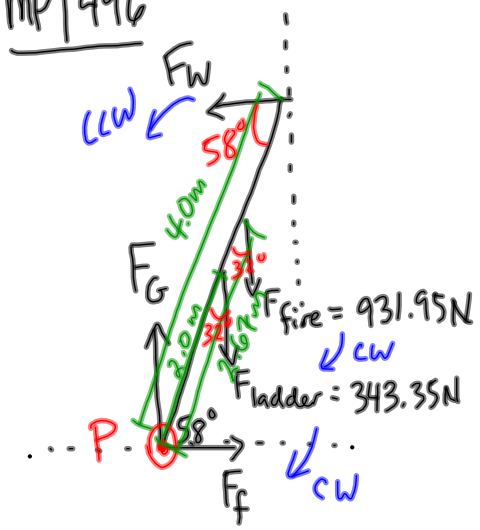
Vertically: $F_A + F_B = F_{red} + F_{plank}$

$$F_A = F_{red} + F_{plank} - F_B$$

$$F_A = 620N + 170N - 296N$$

$F_A = 494N$ 500N

MP | 496



μ = ??

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

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

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

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

$F_w = 496\,N$

Horizontally: $F_f = F_w$

$F_f = 496N$

Vertically: $F_G = F_{ladder} + F_{fire}$

$F_G = 343.35N + 931.95N$

$F_G = 1275.3N = F_N$

$f_f = \mu F_N$

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

$\mu = \dfrac{496N}{1275.3N}$

$\mu = 0.39$

TO DO:

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FOP | §6-3 | 5-7

FOP | Problems | 24, 25, 27-38