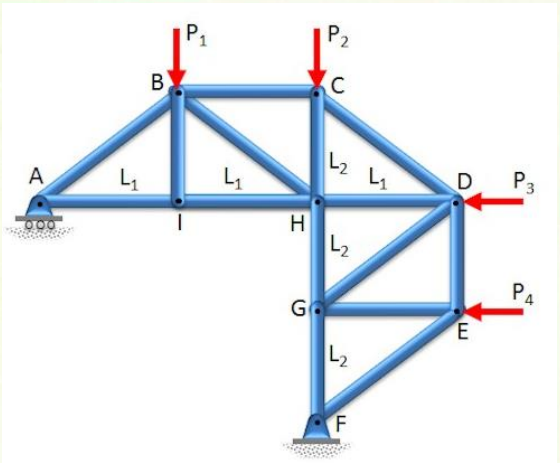
3/11/22 HO 7.2

1. Given:



$P_1 = 100\ lbs$

$P_2 = 150\ lbs$

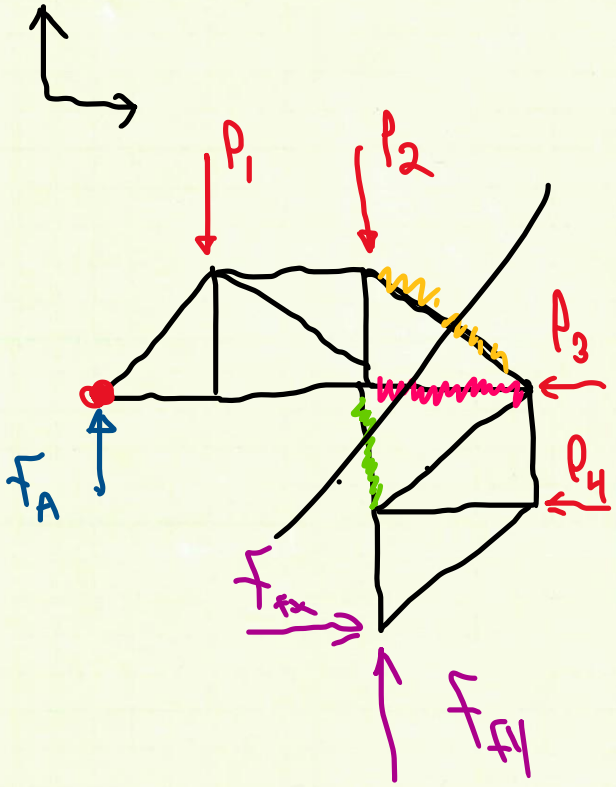
$P_3 = 125\ lbs$

$P_4 = 200\ lbs$ $L_1 = 4\ ft$ $L_2 = 3\ ft$

Find:

f_{CD}, f_{DH}, f_{GH}

Solution:



$\Sigma f_x = 0$

$P_3 + P_4 + f_{fx} = 0$

$-125 - 200 + f_{fx} = 0$

$f_{fx} = 325\ lbs$

$\Sigma M_A = 0$

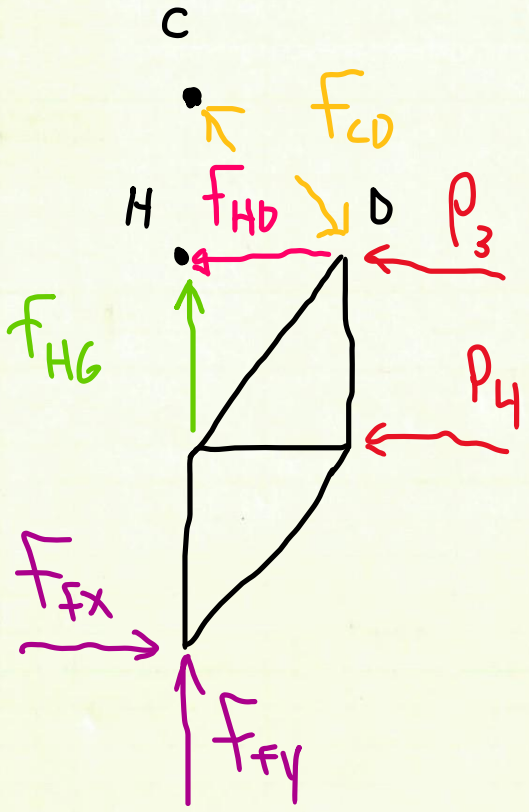
$f_{fx}(2 \times L_2) - P_4(L_2) - P_1(L_1) - P_2(L_1 \times 2) + f_{fy}(L_1 \times 2)$

3/11/22 HO 7.2 Sarah Hartman

$325(6) - 200(3) - 100(4) - 150(8) = -F_{fy}(8)$

-8

$F_{fy} = 31.25$ lbs



$\Sigma M_D = 0$

$-P_4(L_2) + F_{fx}(2 \times L_2)$

$+ -F_{HG}(L_1) - F_{fy}(L_1) = 0$

$$\frac{-P_4(L_2) - F_{fy}(L_1) + F_{fx}(2 \times L_2)}{L_1} = F_{HG}$$

$F_{HG} = 306.25$ lbs T

$\Sigma M_C = 0$

$F_{HD}(L_2) - P_3(L_2) - P_4(L_2 \times 2) + F_{fx}(L_2 \times 3) = 0$

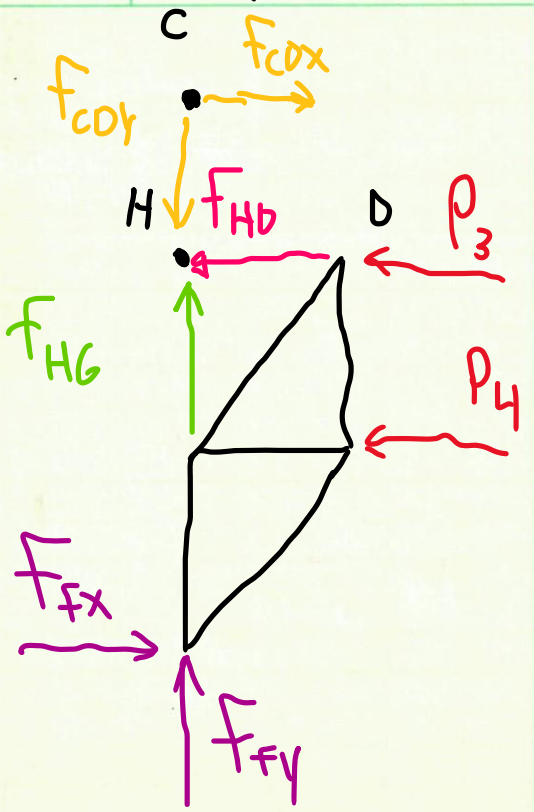
$$F_{HD} = \frac{P_3(L_2) + P_4(L_2 \times 2) - F_{fx}(L_2 \times 3)}{L_2}$$

3/11/22 HO 7.2

$F_{HD} = 450 \text{ lbs T}$

$\Sigma F_x = 0 \qquad \Sigma F_y = 0$

$F_{CDx} = F_{CD}\left(\frac{4}{5}\right)$



X $F_{CD}\left(\frac{4}{5}\right)$ $D = (125 + 200 - 325 + 460)$

Y $F_{CD}\left(\frac{3}{5}\right) = (-31.25 + 306.25)\left(\frac{5}{3}\right)$

$F_{CD} = 562.5 \text{ lbs (C)}$