

6/16/22

HO 7.1

Sam Hanna

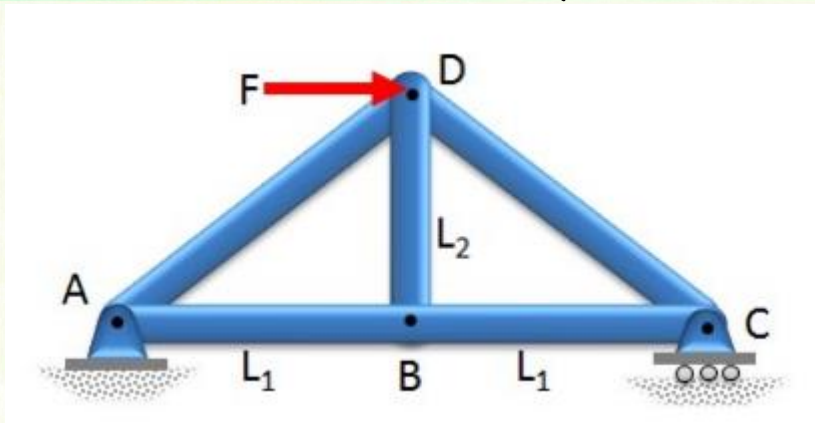
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1. Given:

$$F = 250 \text{ N}$$

$$L_1 = 3 \text{ m}$$

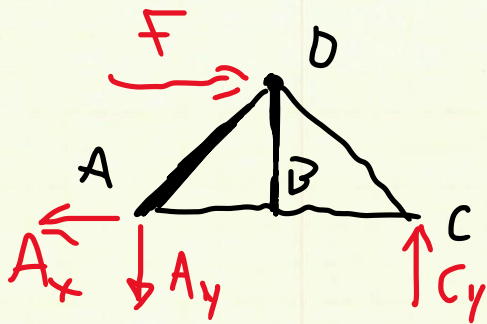
$$L_2 = 4 \text{ m}$$



Find:

FCD, FBC, FBD, FAB, FAD

Solution:



$$\sum M_A = 0$$

$$F(L_2) = C_y(L_1 \times 2)$$

$$\frac{F(L_2)}{L_1 \times 2} = \frac{250(4)}{6} = 166.67 \text{ N} = C_y$$

$$\sum F_x = 0$$

$$F = A_x = 250 \text{ N}$$

$$\sum F_y = 0$$

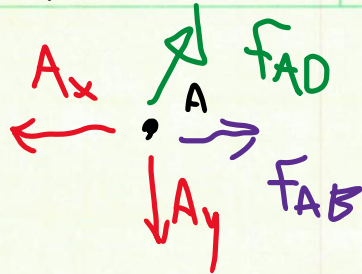
$$A_y = C_y = 166.67 \text{ N}$$

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$$\Sigma F_y = 0$$

$$F_{AD}(4/5) - A_y = 0$$

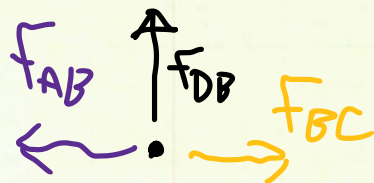
$$\Sigma F_x = 0$$

$$F_{AD}(3/5) + F_{AB} - A_x = 0$$

$$F_{AD} = A_y(5/4) =$$

$$\underline{\underline{208.33 \text{ N (T)}}} \leftarrow F_{AD}$$

$$F_{AB} = A_x - F_{AD}(3/5) = \underline{\underline{125 \text{ N (T)}}} \leftarrow F_{AB}$$



$$\Sigma F_y = 0$$

$$\underline{\underline{F_{DB} = 0 \text{ N}}} \leftarrow F_{DB}$$

$$\Sigma F_x = 0$$

$$F_{BC} - F_{AB} = 0$$

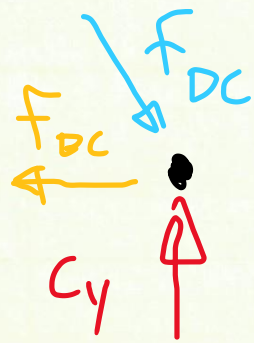
$$F_{AB} = F_{BC} = \underline{\underline{125 \text{ N (T)}}} \leftarrow F_{BC}$$

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$$F_y = 0$$

$$C_y - F_{DC} \left( \frac{4}{5} \right) = 0$$

$$C_y \left( \frac{5}{4} \right) = F_{DC} = \underline{\underline{200 \text{ N (C)}}} \quad \leftarrow F_{DC}$$

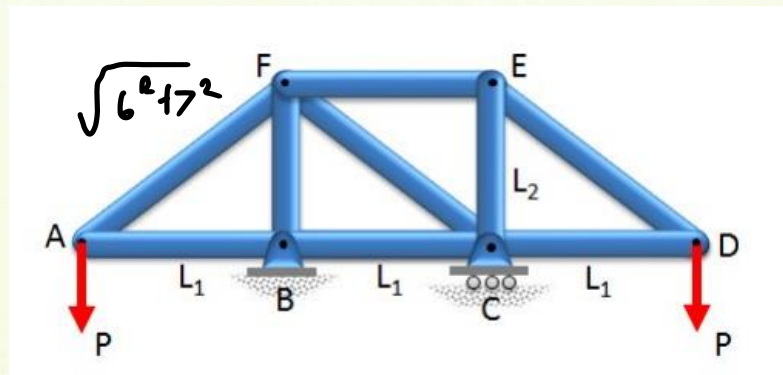
2. Given :

$$P = 400 \text{ lbs}$$

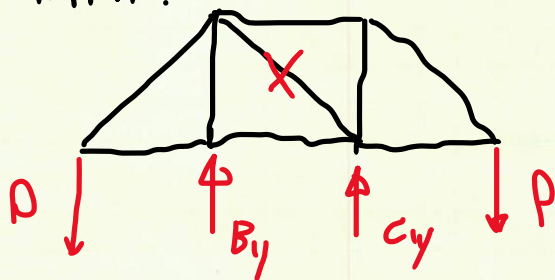
$$L_1 = 6 \text{ ft}$$

$$L_2 = 7 \text{ ft}$$

find:

 $F_{AB}, F_{BC}, F_{CD}, F_{AF}, F_{EF}, F_{CF}, F_{CE}, F_{DE}, F_{BF}$ 


Solution :



$$F_{CF} = 0 \text{ N}$$

$$B_y = P \quad C_y = P$$



$$\sum F_y = 0$$

$$F_{AF} \left( \frac{7}{9.22} \right) - P = 0$$

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H0 &gt; 1

~~SPH 100~~

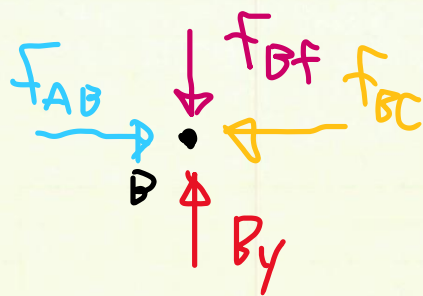
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$$F_{AF} = P\left(\frac{9.22}{7}\right) = 526.83 \text{ lbf (T)} \quad \leftarrow F_{AF}^1$$

$$\sum F_x = 0$$

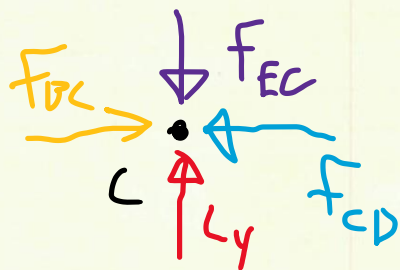
$$F_{AF}\left(\frac{6}{9.22}\right) - F_{AB} = 0$$

$$F_{AB} = F_{AF}\left(\frac{6}{9.22}\right) = 342.86 \text{ lbf (C)} \quad \leftarrow F_{AB}$$



$$F_{BC} = F_{AB} = \underline{\underline{342.86 \text{ lbf (C)}}} \quad \leftarrow F_{BC}$$

$$F_{BF} = B_y = \underline{\underline{400 \text{ lbf (C)}}} \quad \leftarrow F_{BF}$$



$$F_{EC} = C_y = \underline{\underline{400 \text{ lbf (C)}}} \quad \leftarrow F_{EC}$$

$$F_{CD} = F_{BC} = \underline{\underline{342.86 \text{ lbf (C)}}} \quad \leftarrow F_{CD}$$

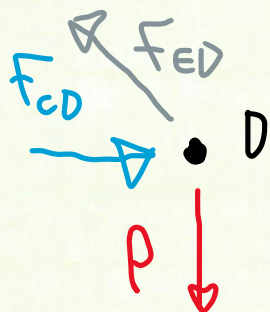


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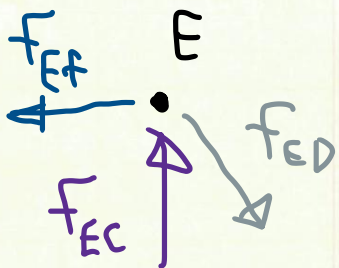
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$$\sum F_y = 0$$

$$F_{ED} \left( \frac{7}{9.22} \right) - P = 0$$

$$F_{ED} = P \left( \frac{9.22}{7} \right) = \underline{\underline{526.83 \text{ lbs (T)}}} \leftarrow F_{ED}$$



$$\sum F_x = 0$$

$$F_{ED} \left( \frac{6}{9.22} \right) - F_{EF} = 0$$

$$F_{EF} = F_{ED} \left( \frac{6}{9.22} \right) = \underline{\underline{342.86 \text{ lbs (T)}}} \leftarrow F_{EF}$$