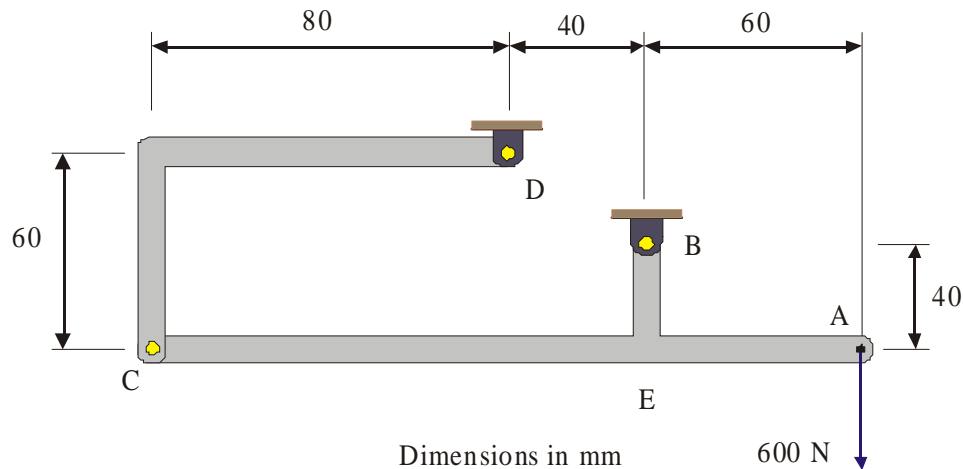


# Example 3.13

J. Frye

### Example 3.13:

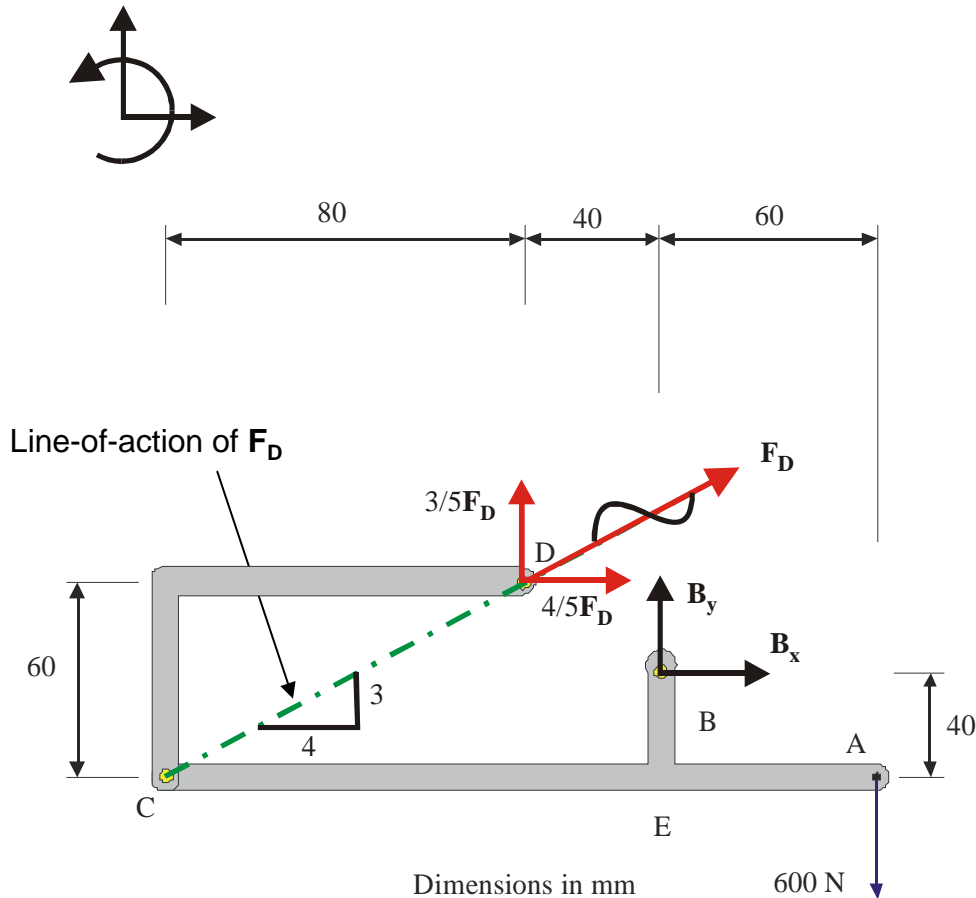
Determine the reactions at B and D considering CD as a two-force member.



Member CD is a 2-Force member since it has a pin at either end and no other forces applied to the member between the two pins.

The reaction at external support D can be represented by a single force with a line-of-action directed along the line joining C and D

We replace  $F_D$  with its components and apply the equilibrium equations:



$$\sum F_x = 0 \rightarrow$$

$$0.8F_D + B_x = 0 \quad (1)$$

$$\sum F_y = 0 \uparrow \quad (2)$$

$$\sum M_B = 0 \curvearrowright \quad (3)$$

$$\begin{aligned} -0.6F_D(0.04) - 0.8F_D(0.02) - 600(0.06) &= 0 \\ -0.04F_D &= 36 \end{aligned}$$

$$F_D = -900\text{ N}$$

$$\therefore F_D = 900\text{ N}$$



Substitute in (1):

$$0.8(-900) + B_x = 0$$

$$B_x = +720\text{ N}$$

$$\therefore B_x = 720\text{ N} \rightarrow$$

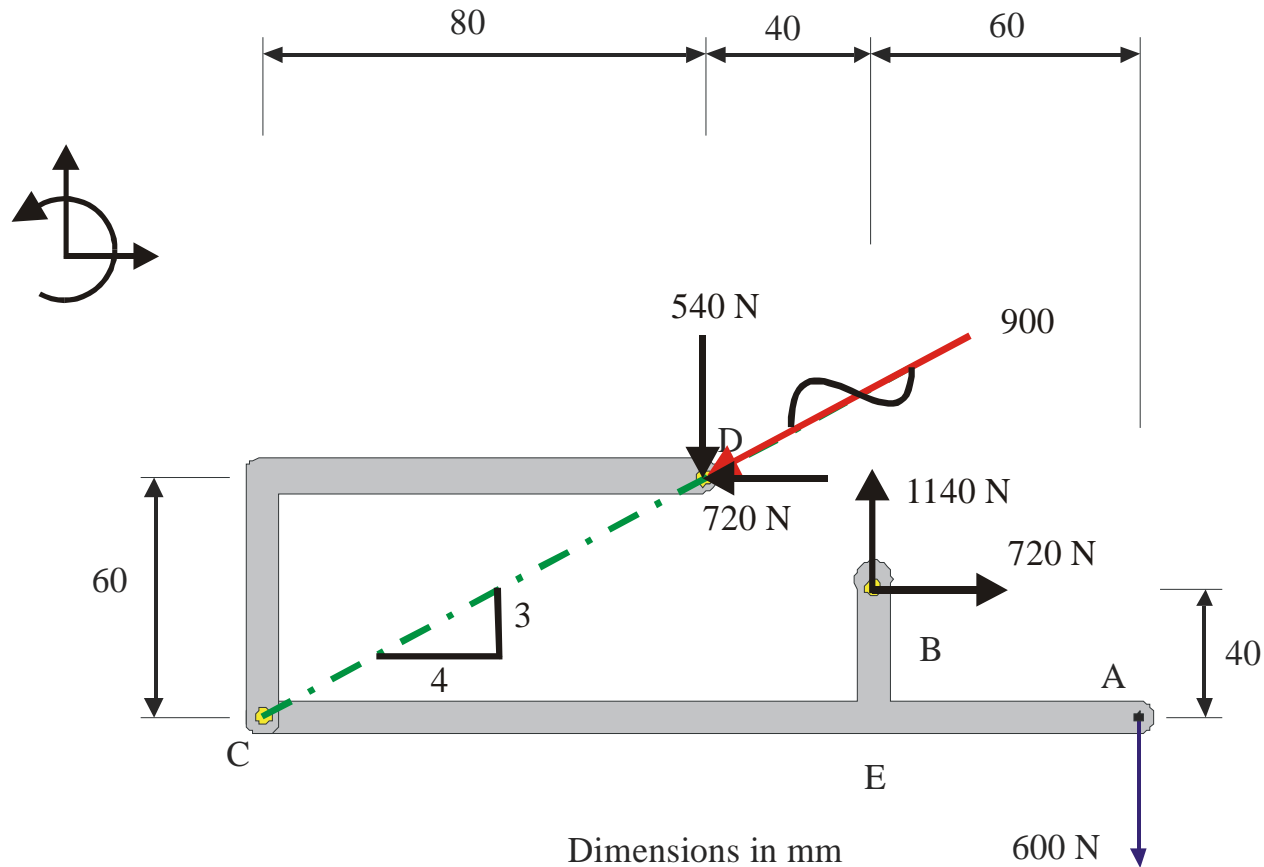
Substitute in (2):

$$0.6(-900) + B_y - 600 = 0$$

$$B_y = +1140\text{ N}$$

$$\therefore B_y = 1140\text{ N} \uparrow$$

To check our answer we take moments about Point A.



$$\sum M_A = 0 \quad \curvearrowright$$

$$540(0.1) + 720(0.06) - 1140(0.06) - 720(0.04) = 0$$

$$0 = 0 \quad \text{Checks!!!!}$$