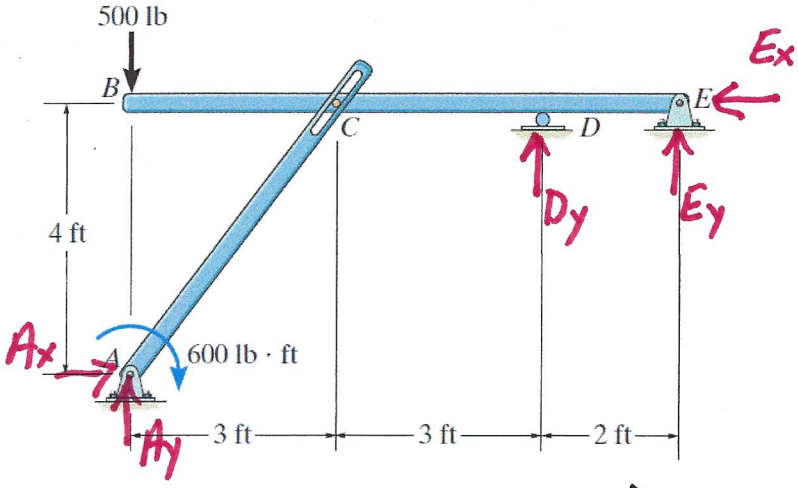
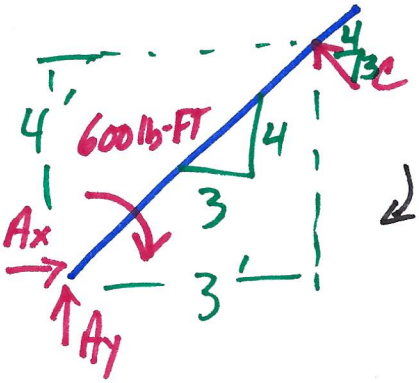
Problem 18: The two-member structure is connected at *C* by a pin, which is fixed to *BDE* and passes through the smooth slot in member *AC*. Determine the horizontal and vertical components of reaction at the supports.

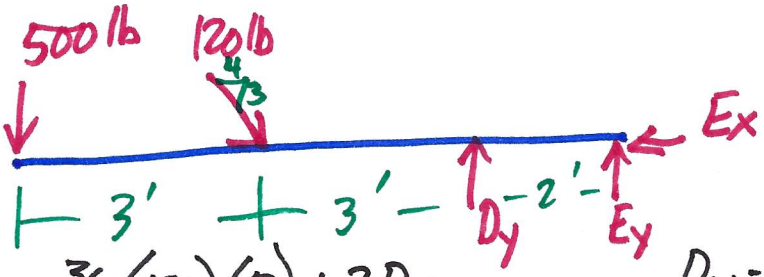


FBD OF AC



$\circlearrowleft \Sigma M_A = 0 = 600 - 5C \Rightarrow C = 120 \text{ lb}$

FBD OF BCDE



$\circlearrowleft \Sigma M_E = 0 = -500(6) - \frac{3}{5}(120)(5) + 2D_y$

$\rightarrow \Sigma F_x = 0 = 120(\frac{4}{5}) - E_x$

$\uparrow \Sigma F_y = 0 = -500 - \frac{3}{5}(120) + 2180 + E_y$

$\rightarrow \Sigma F_x = 0 = A_x - \frac{4}{5}(120)$

$\uparrow \Sigma F_y = 0 = A_y + \frac{3}{5}(120)$

$D_y = 2180 \text{ lbs} \uparrow$

$E_x = 96 \text{ lbs} \leftarrow$

$E_y = 1608 \text{ lbs} \downarrow$

$A_x = 96 \text{ lbs} \rightarrow$

$A_y = 72 \text{ lbs} \downarrow$

ANSWER: Ax = 96 lb →, Ay = 72 lb ↓, Dy = 2.18 lb ↑, Ex = 96 lb ←, Ey = 1.61 kips ↓