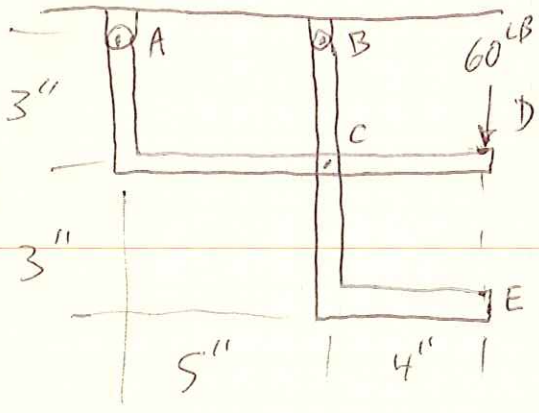
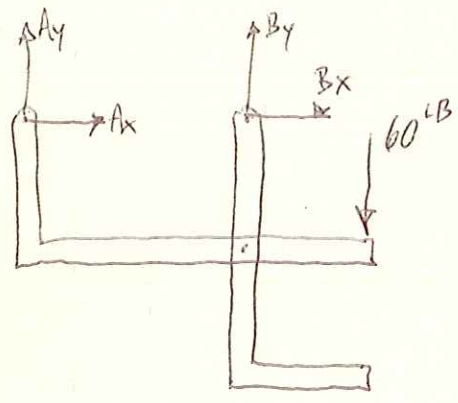


EXAMPLE PROB. 6.87

No. 937 811E  
Engineer's Computation Pad  
STAEDTLER®



a) FBD OF ENTIRE FRAME: LOAD APPLIED AT D



$\Sigma F_x = 0 :$

$\Sigma F_y = 0 :$

$A_x + B_x = 0$

$A_y + B_y - 60 = 0$

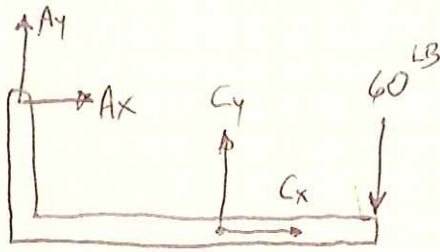
$\Sigma M_B = 0 \curvearrowright :$

$-(5^{in})A_y - (4^{in})(60^{lb}) = 0$

$A_y = -48^{lb}$

$B_y = 60 - A_y = 108^{lb}$

BREAK FRAME APART:



$$\Sigma F_x = 0: A_x + C_x = 0$$

$$\Sigma F_y = 0: A_y + C_y - 60 = 0$$

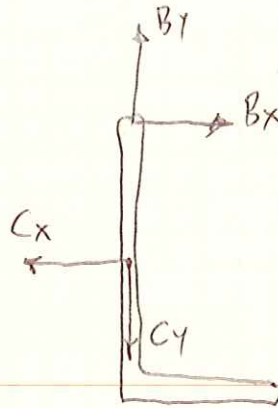
$$\Sigma M_c = 0 \text{ (+)}:$$

$$-(5^{\text{ft}})A_y - (3^{\text{ft}})A_x - (4^{\text{ft}})(60^{\text{lb}}) = 0$$

$$C_y = 60 - A_y = 60 - (-48) = 108^{\text{lb}}$$

$$A_x = \frac{[-(5^{\text{ft}})(-48^{\text{lb}}) - (4^{\text{ft}})(60^{\text{lb}})]}{(3^{\text{ft}})} = 0!$$

$$\therefore B_x = 0 \text{ AND } C_x = 0$$



$$\Sigma F_x = 0:$$

$$B_x - C_x = 0$$

$$\Sigma F_y = 0:$$

$$B_y - C_y = 0$$

$$C_y = 108^{\text{lb}} \checkmark$$

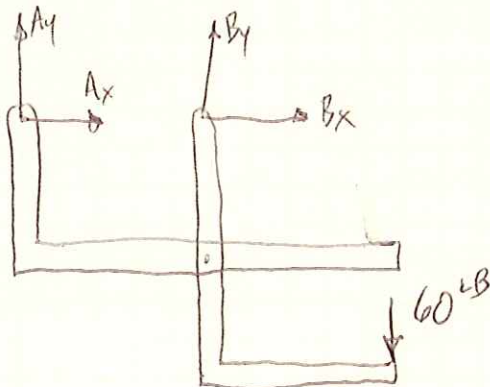
$$\Sigma M_B = 0 \text{ (+)}:$$

$$-(3^{\text{ft}})C_x = 0$$

$$\therefore C_x = 0, B_x = 0 \checkmark$$

BCE IS A  
TWO-FORCE  
MEMBER.

b) FBD OF ENTIRE FRAME: LOAD APPLIED AT E



$$\Sigma F_x = 0: A_x + B_x = 0$$

$$\Sigma F_y = 0: A_y + B_y - 60 = 0$$

$$\Sigma M_B = 0 \text{ (+)}:$$

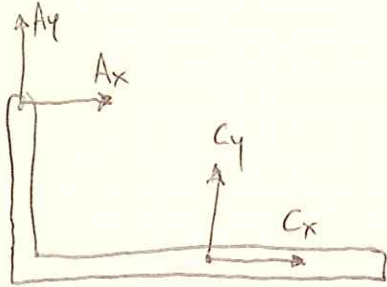
$$-(5^{\text{ft}})A_y - (4^{\text{ft}})(60^{\text{lb}}) = 0$$

$$A_y = -48^{\text{lb}}$$

$$B_y = 60 - A_y = 108^{\text{lb}}$$

SAME  
AS  
BEFORE

BREAK FRAME APART:



$$\sum F_x = 0: A_x + C_x = 0$$

$$\sum F_y = 0: A_y + C_y = 0$$

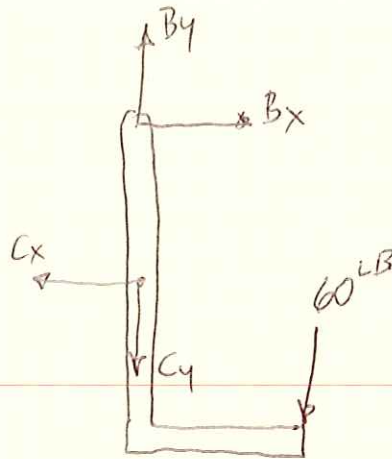
$$\sum M_C = 0: C_y = -A_y = 48 \text{ LB}$$

$$\sum M_A = 0 (+):$$

$$+(5'')(48 \text{ LB}) + (3'')C_x = 0$$

$$C_x = -80 \text{ LB}$$

$$A_x = -(-80 \text{ LB}) = 80 \text{ LB}$$

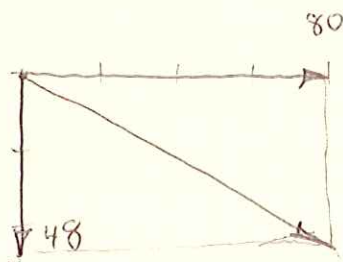


$$\sum F_x = 0: B_x - C_x = 0$$

$$B_x = -80 \text{ LB}$$

$$\sum F_y = 0: B_y - C_y - 60 = 0$$

$$B_y = C_y + 60 = 108 \text{ LB}$$



ACE IS A  
TWO-FORCE  
MEMBER!

