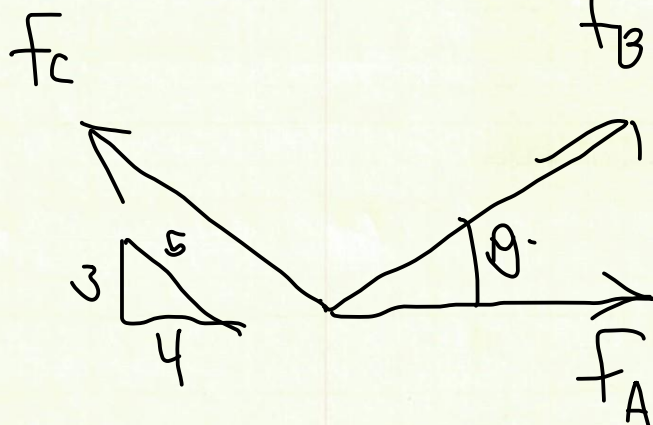


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ME201 H01.3

Statics/Force

1.



$$\theta = 40^\circ$$

$$F_C = 450 \text{ N}$$

$$F_B = 575 \text{ N}$$

$$F_A = 425 \text{ N}$$

$$F_{Cx} = F_C \cos\left(\tan^{-1}\frac{3}{4}\right) = 360 \text{ N}$$

$$F_{Cy} = F_C \sin\left(\tan^{-1}(3/4)\right) = 270 \text{ N}$$

$$F_{Bx} = F_B \cos(40) = 440.48 \text{ N}$$

$$F_{By} = F_B \sin(40) = 369.60 \text{ N}$$

$$F_{Ax} = F_A = 425 \text{ N}$$

$$F_{Cx} + F_{Bx} + F_{Ax} = F_{Rx} = 505.48 \text{ N}$$

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

$$\theta = \tan^{-1}\left(\frac{F_{Ry}}{F_{Rx}}\right) = 51.68^\circ$$

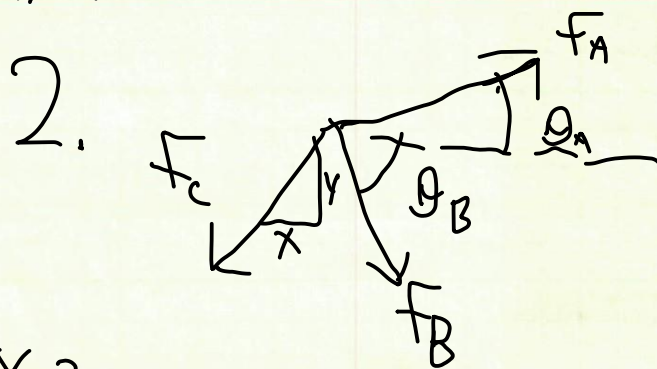
$$F_{Cy} + F_{By} + F_{Ay} = F_{Ry} = 639.60 \text{ N}$$

$$F_R = \sqrt{F_{Ry}^2 + F_{Rx}^2} = 815.23 \text{ N}$$

4/26/21

ME 201 Hol. 3

John Watson



$$X=3$$

$$Y=4$$

$$F_A = ? \quad \theta_A = ?$$

$$F_B = 650 \text{ N} \quad \theta_B = 60^\circ$$

$$F_C = 400 \text{ N}$$

$$F_A = 800 \text{ N} \quad \theta_A = 35^\circ$$

$$F_{Rx} = F_{Ax} + F_{Bx} + F_{Cx} = F_{Ax} = F_{Ax} - F_{Bx} - F_{Cx}$$

$$F_{Ay} = F_{Ry} - F_{By} - F_{Cy}$$

$$F_{Ay} = 424.06$$

$$F_{Ax} = 570.32$$

$$F_{Ry} = F_R \sin 35^\circ = -458.86 \text{ N}$$

$$F_{Rx} = F_R \cos 35^\circ = 655.32 \text{ N}$$

$$F_A = \sqrt{F_{Ax}^2 + F_{Ay}^2}$$

$$79.69 \text{ N}$$

$$711 \text{ N}$$

$$F_{By} = F_B \sin 60^\circ = 562.92$$

$$F_{Bx} = F_B \cos 60^\circ = 325 \text{ N}$$

$$\theta = \tan^{-1} \left(\frac{F_{Ay}}{F_{Ax}} \right) = 36.6^\circ$$

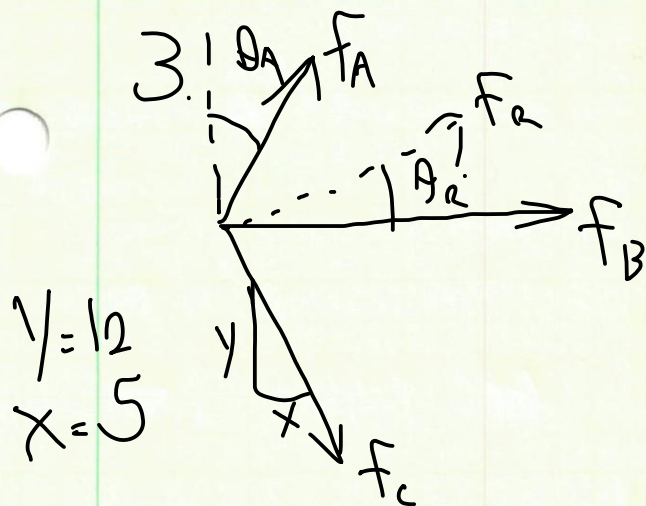
$$F_{Cy} = F_C \sin(\tan^{-1}(4/3)) = -320 \text{ N}$$

$$F_{Cx} = -F_C \cos(\tan^{-1}(4/3)) = -240 \text{ N}$$

4/26/21

ME201-H01.3

Seth Hoffman



$$F_R = 460 \text{ N} \quad \theta_R = 35^\circ$$

$$F_B = 220 \text{ N} \quad \theta_B = 0^\circ$$

$$F_C = 280 \text{ N}$$

$$F_A = ? \quad \theta_A = ?$$

$$F_{Ay} = F_{Ry} - F_{By} - F_{Cy}$$

$$F_{Ay} = 516.57 \text{ N}$$

$$F_{Ax} = F_{Rx} - F_{Bx} - F_{Cx}$$

$$F_{Ax} = 41.28 \text{ N}$$

$$F_A = \sqrt{F_{Ay}^2 + F_{Ax}^2}$$

$$F_{Ry} = F_R \sin 35^\circ = 298.11 \text{ N}$$

$$518.22 \text{ N}$$

$$F_{Rx} = F_R \cos 35^\circ = 368.62 \text{ N}$$

$$F_{By} = 0$$

$$\theta = 90 - \tan^{-1} \left(\frac{F_{Ay}}{F_{Ax}} \right)$$

$$4.57^\circ$$

$$F_{Bx} = F_B = 220 \text{ N}$$

$$F_{Cy} = -F_C \sin(\tan^{-1}(12/5)) = -258.46 \text{ N}$$

$$F_{Cx} = F_C \cos(\tan^{-1}(12/5)) = 157.34 \text{ N}$$