

$$\begin{aligned} \underline{2/2} \quad \underline{\underline{\underline{F}}} &= 400 (-\cos 30^\circ \underline{i} + \sin 30^\circ \underline{j}) \\ &= -346 \underline{i} + 200 \underline{j} \text{ N} \end{aligned}$$

$$\text{Scalar components: } \begin{cases} F_x = -346 \text{ N} \\ F_y = 200 \text{ N} \end{cases}$$

$$\text{Vector components: } \begin{cases} \underline{F}_x = -346 \underline{i} \text{ N} \\ \underline{F}_y = 200 \underline{j} \text{ N} \end{cases}$$

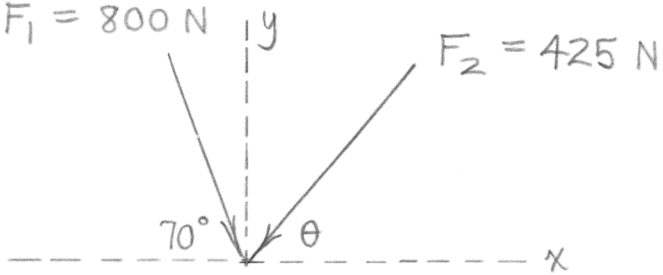
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$$\begin{aligned} \underline{2/4} \quad \underline{\underline{\underline{\underline{F}}}}} &= F \underline{n}_{AB} = 34 \left[\frac{15\underline{i} + 8\underline{j}}{\sqrt{15^2 + 8^2}} \right] \\ &= 30\underline{i} + 16\underline{j} \text{ kN} \end{aligned}$$

$$\text{Scalar components: } \begin{cases} F_x = 30 \text{ kN} \\ F_y = 16 \text{ kN} \end{cases}$$

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2/6



$F_1 = 800 \text{ N}$

$F_2 = 425 \text{ N}$

70°

θ

x

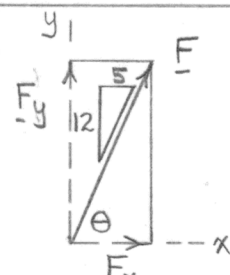
y

$$R_x = \sum F_x = 800 \cos 70^\circ - 425 \cos \theta = 0$$
$$\theta = 49.9^\circ$$
$$R_y = \sum F_y = -800 \sin 70^\circ - 425 \sin 49.9^\circ$$
$$= -1077 \text{ N}$$

So $R = 1077 \text{ N}$

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$\cos \theta = \frac{5}{13}, \sin \theta = \frac{12}{13}$

$F_y = F \sin \theta = F \frac{12}{13} = 320 \text{ N}$

$F = 347 \text{ N}$

$F_x = F \cos \theta = 347 \left(\frac{5}{13} \right) = \underline{133.3 \text{ N}}$

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$$R_x = \sum F_x = 400 + 400 \cos 60^\circ = 600 \text{ N}$$

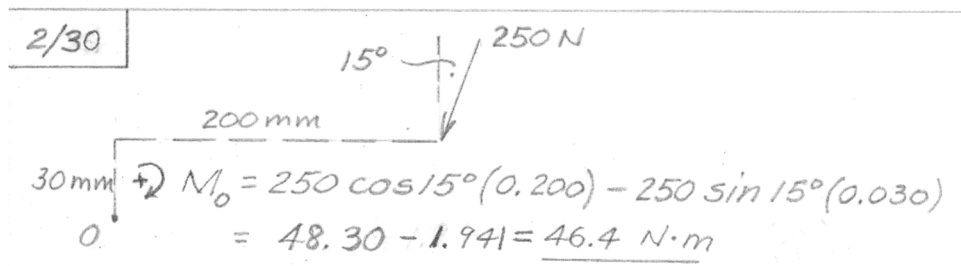
$$R_y = \sum F_y = 400 \sin 60^\circ = 346 \text{ N}$$

$$\Rightarrow \underline{R} = \underline{600\mathbf{i} + 346\mathbf{j} \text{ N}}$$

$$R = \sqrt{600^2 + 346^2} = \underline{693 \text{ N}}$$

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2/30



15° 250 N

200 mm

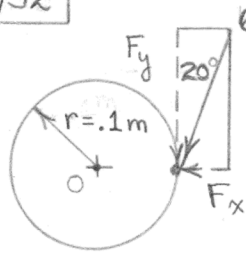
30 mm

O

$$+ \curvearrowright M_O = 250 \cos 15^\circ (0.200) - 250 \sin 15^\circ (0.030)$$
$$= 48.30 - 1.941 = \underline{46.4 \text{ N}\cdot\text{m}}$$

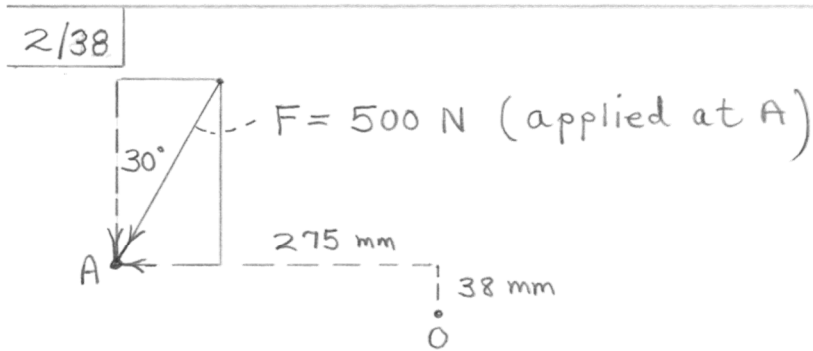
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$$\begin{aligned} 60 \text{ N} + 2 M_o &= r F_y \\ &= (0.1) (60 \cos 20^\circ) \\ &= \underline{5.64 \text{ N}\cdot\text{m}} \end{aligned}$$

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$$\begin{aligned} \curvearrowright M_o &= 500 \cos 30^\circ (0.275) + 500 \sin 30^\circ (0.038) \\ &= \underline{128.6 \text{ N}\cdot\text{m} \text{ CCW}} \end{aligned}$$

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