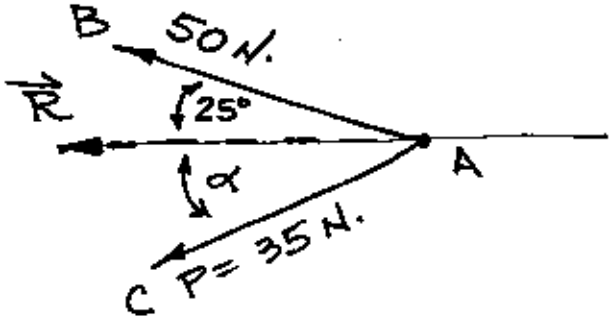
PROB. 2.9



$$\vec{R} = \Sigma F = \vec{F}_{AB} + \vec{F}_{AC}$$

$$R_H = F_{AB_H} + F_{AC_H} = ?$$

$$R_V = F_{AB_V} + F_{AC_V} = 0$$

DETERMINE $|\vec{R}|$ AND α

$$R_H = -50^N \cos 25° - 35^N \cos\alpha$$

$$R_V = +50^N \sin 25° - 35^N \sin\alpha = 0$$

$$\therefore 50 \sin 25° = 35 \sin\alpha$$

$$\frac{50 \sin 25}{35} = \sin\alpha = 0.6037$$

$$\alpha = \text{arc sin } 0.6037$$

$$\boxed{\alpha = 37.138° = 37.1°}$$

$$R_H = -50 \cos 25° - 35 \cos 37.1°$$

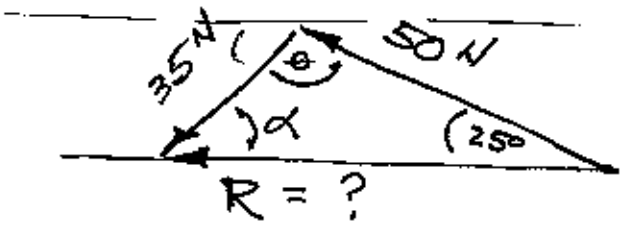
$$= -73.23\ N.$$

$$\boxed{\vec{R} = -73.23\hat{\imath}}$$

$$\boxed{\text{MAG.} = 73.23\ N. \quad \text{TO LEFT}}$$

~~~ OR ~~~ CLOSE POLYGON

KNOWING THE RESULTANT IS HORIZONTAL:



Law of Sines.

$$\frac{35^N}{\sin 25°} = \frac{50^N}{\sin\alpha}$$

$$\alpha = \text{arc sin}\left[\frac{50}{35} \sin 25°\right] = 37.1°$$

$$\therefore \theta = 180 - 25° - 37.1° = 117.86$$

$$\frac{R}{\sin 117.86°} = \frac{35}{\sin 25°} \quad \therefore R = 35 \frac{\sin 117.86}{\sin 25°} = 73.22\ N.$$
~~~