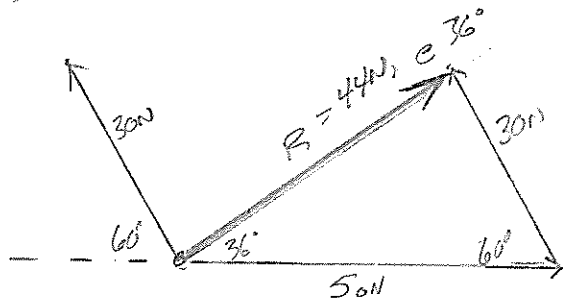


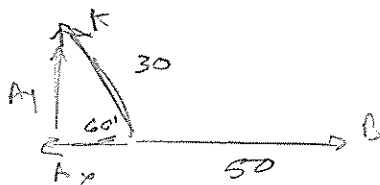
# KEY - Dist / Displ / Vectors

1)

## SCALE MODEL



## COMPONENTS



$$A_x = 30 \cos 60$$
$$= -15$$

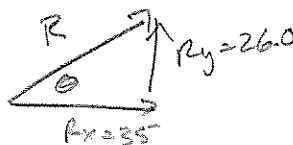
$$A_y = 30 \sin 60$$
$$= 26.0$$

$$B_x = 50$$

$$B_y = 0$$

$$R_x = A_x + B_x$$
$$= -15 + 50 = 35$$

$$R_y = A_y + B_y$$
$$= 26.0 + 0 = 26.0$$



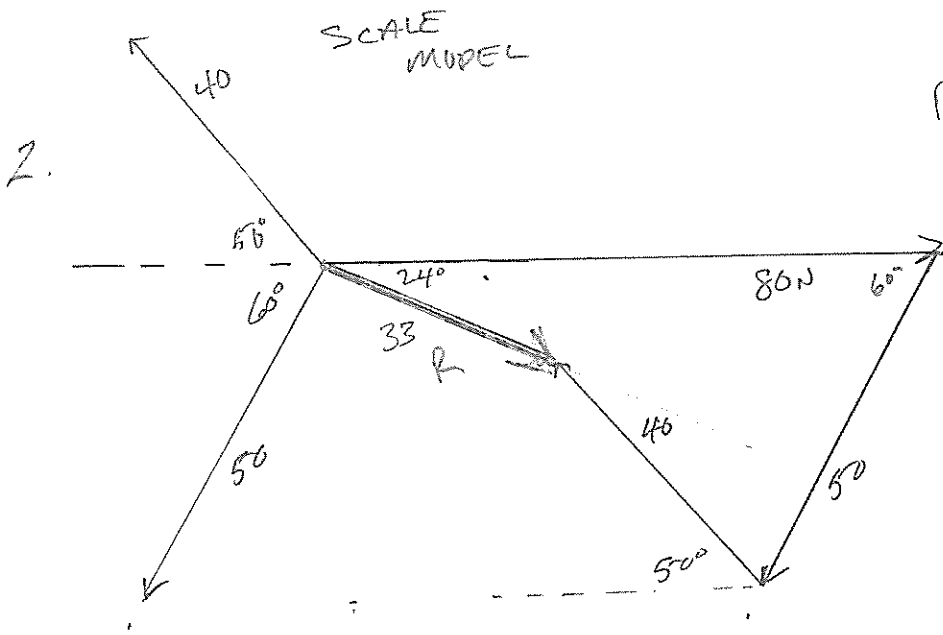
$$R^2 = 26.0^2 + 35^2$$

$$R^2 = 1901$$

$$R = 43.6$$

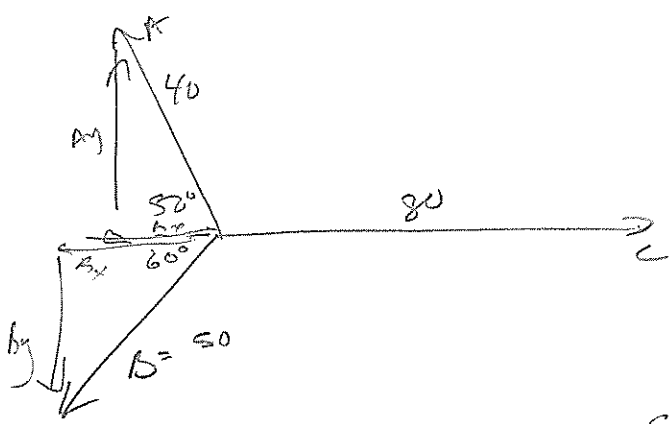
$$\tan \theta = 26/35$$

$$\theta = 35.6^\circ$$



$$R = 33 \text{ e } 24^\circ \text{ S } \&E$$

COMPONENTS



$$A_x = 40 \cos 50 = 25.7$$

$$A_y = 40 \sin 50 = +30.6$$

$$B_x = 50 \cos 60 = 25$$

$$B_y = 50 \sin 60 = 43.3$$

$$C_x = 80$$

$$C_y = 0$$

$$R_x = A_x + B_x + C_x$$

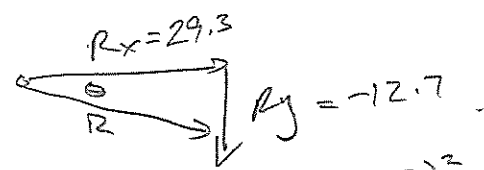
$$= -25.7 - 25 + 80$$

$$= +29.3$$

$$R_y = A_y + B_y + C_y$$

$$= +30.6 - 43.3 + 0$$

$$= -12.7$$



$$R^2 = 29.3^2 + (-12.7)^2$$

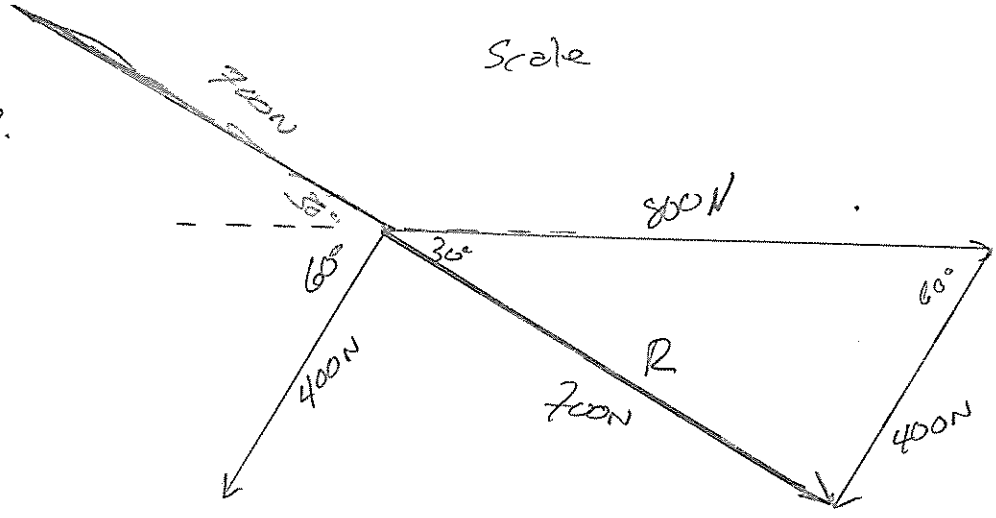
$$R^2 = 1019.8$$

$$R = 31.9$$

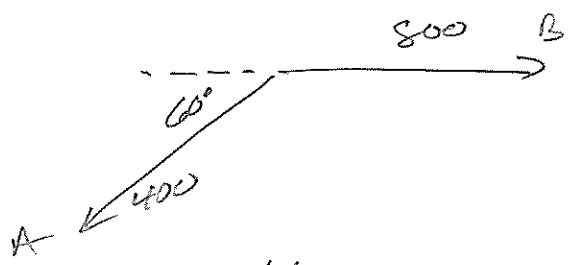
$$\tan \theta = \frac{12.7}{29.3}$$

$$\theta = 23.5^\circ$$

3.



Components



$$A_x = 400 \cos 60$$

$$A_x = 200 \text{ N}$$

$$A_y = 400 \sin 60$$

$$A_y = 346.4 \text{ N}$$

$$B_x = 800 \text{ N}$$

$$B_y = 0 \text{ N}$$

$$R_x = A_x + B_x$$

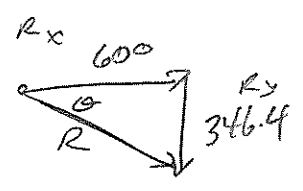
$$= -200 + 800$$

$$= \boxed{+600}$$

$$R_y = A_y + B_y$$

$$= -346.4 + 0$$

$$= \boxed{-346.4}$$



$$R^2 = 600^2 + 346.4^2$$

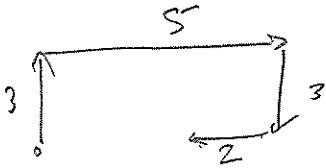
$$= 479,993$$

$$\boxed{R = 692.8 \text{ N}}$$

$$\tan \theta = \frac{346.4}{600}$$

$$\boxed{\theta = 30.0^\circ}$$

4.



$$\bullet \text{ Dist} = 3 + 5 + 3 + 2$$

$$= 13 \text{ miles}$$

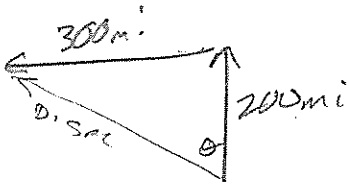
$$\bullet \text{ Displ} = 3 \text{ mi east}$$

$$\bullet \text{ speed } \bar{v} = \frac{d}{t} = \frac{13 \text{ mi}}{5 \text{ hr}} = 2.6 \text{ mi/hr}$$

• Velocity

$$\bar{v} = \frac{d}{t} = \frac{3 \text{ mi east}}{5 \text{ hr}} = -6 \text{ mi/hr, east}$$

5.



$$\tan \theta = \frac{300}{200}$$

$$\theta = 56.3^\circ$$

$$t = 4 \text{ hr} + 1 \text{ hr} + 5 \text{ hr} = 10 \text{ hrs.}$$

$$\text{Dist} = 500 \text{ mi}$$

Displacement = ?

$$D^2 = 300^2 + 200^2$$

$$D = 360.6 \text{ mi}$$

• speed

$$\bar{v} = \frac{d}{t} = \frac{500 \text{ mi}}{10 \text{ hr}} = 50 \text{ mi/hr}$$

• velocity = ?

$$\bar{v} = \frac{D}{t} = \frac{360.6 \text{ mi}}{10 \text{ hr}} = 36.06 \text{ mi/hr}$$

6.

$$\bar{v} = \frac{d}{t}$$

$$40 \text{ m/hr} = \frac{600}{t}$$

$$40t = 600$$

$$t = 15 \text{ hrs.}$$

7.

$$\bar{v} = 2 \text{ cm/min}$$

$$t = 60 \text{ min}$$

d = ?

$$\bar{v} = \frac{d}{t}$$

$$d = \bar{v} t = (2 \text{ cm/min})(60 \text{ min}) = 120 \text{ cm.}$$

$$d = 1.2 \text{ meters}$$