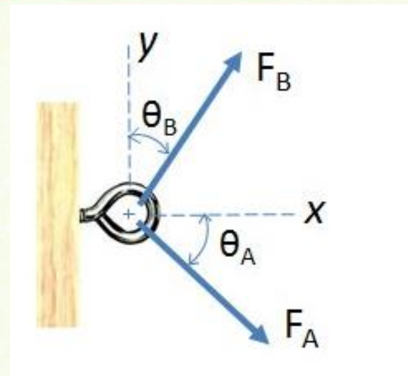
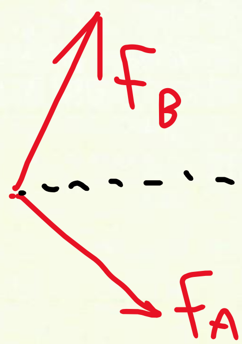
1. Given: $F_A = 10$ N, $F_B = 5$ N, $\theta_A = 50°$, $\theta_B = 35°$

Find: F_R, θ_R



Solution:



$F_{Bx} = 5\sin 35 = 2.868$ N

$F_{By} = 5\cos 35 = 4.1$ N

$F_{Ax} = 10\cos 50 = 6.43$ N

$F_{Ay} = -10\sin 50 = -7.66$ N

$F_{Rx} = 2.868 + 6.43 = 9.3$ N

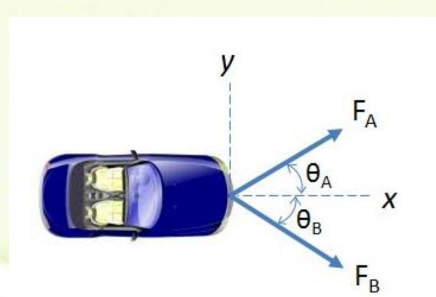
$F_{Ry} = 4.1 - 7.66$ N $= -3.56$ N

$F_R = \sqrt{9.3^2 + 3.56^2} = \underline{9.96 \text{ N}}$ ← F_R

$\theta_R = \tan^{-1}(-3.56/9.3) = \underline{-21°}$ ← θ_R

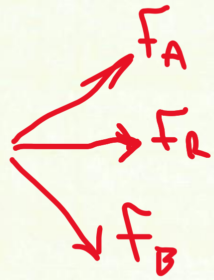
---

2. Given: $F_R = 975$ N, $\theta_A = 40°$, $\theta_B = 75°$



Find: F_A, F_B

Solution:



$$F_A \cos 40 + F_B \cos 75 = 975$$

$$F_A \sin 40 - F_B \sin 75 = 0$$

$$\frac{F_A \sin 40 = F_B \sin 75}{\sin 40}$$

$$F_A = F_B \frac{\sin 75}{\sin 40}$$

$$F_B \frac{\sin 75}{\sin 40} \cos 40 + F_B \cos 75 = 975$$

$$F_B \left(\frac{\sin 75}{\tan 40} + \cos 75 \right) = 975$$

$$F_B = \frac{975}{\frac{\sin 75}{\tan 40} + \cos 75} = \underline{\underline{692\ N}} \leftarrow F_B$$

$$F_A = 691.5 \left(\frac{\sin 75}{\sin 40} \right) = 1040\ N \leftarrow F_A$$