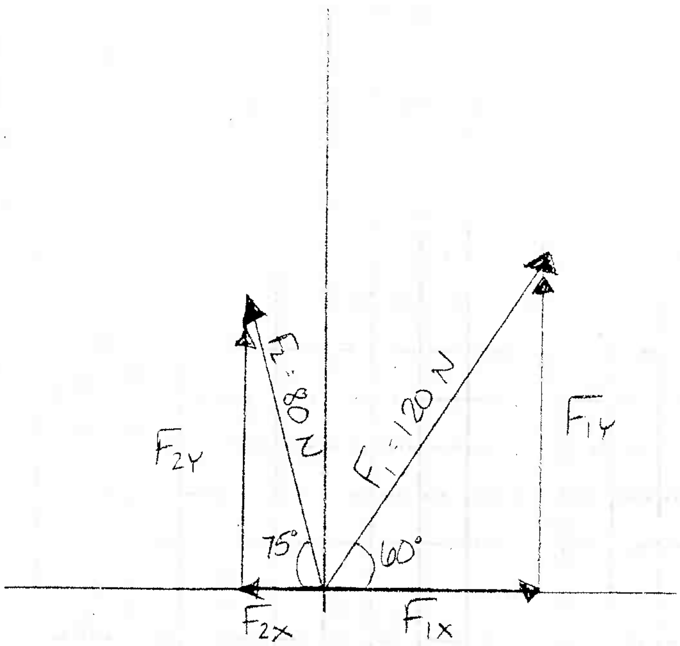
P #18

a)



$F_{2x} = F_2 \cdot \cos\theta$
$= (80\text{ N})(\cos 75°)$
$= -20.7\text{ N}$

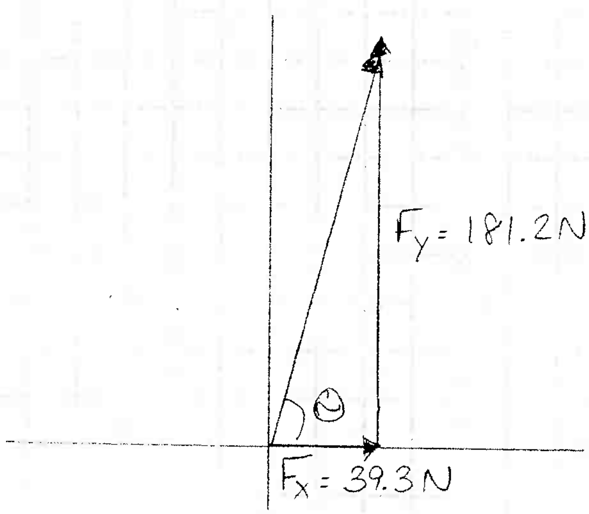
$F_{2Y} = F_2 \cdot \sin\theta$
$= (80\text{ N})(\sin 75°)$
$= +77.3\text{ N}$

$F_{1x} = F_1 \cdot \cos\theta$
$= (120\text{ N})(\cos(60°))$
$= +60\text{ N}$

$F_{1Y} = F_1 \cdot \sin\theta$
$= (120\text{ N})(\sin 60°)$
$= +103.9\text{ N}$

$F_x = F_{1x} + F_{2x}$
$= 60\text{N} + (-20.7\text{N})$
$= +39.3\text{ N}$

$F_Y = F_{1Y} + F_{2Y}$
$= 103.9\text{N} + 77.3\text{ N}$
$= +181.2\text{ N}$



$F = \sqrt{F_x^2 + F_y^2}$

$= \sqrt{(39.2\text{N})^2 + (181.2\text{ N})^2}$

$\boxed{F = 185\text{ N}}$

$\theta = \tan^{-1}\left(\frac{F_Y}{F_x}\right)$

$= \tan^{-1}\left(\frac{181.2\text{N}}{39.3\text{ N}}\right)$

$\theta = 77.8°$ above +x-axis