Quiz 2b
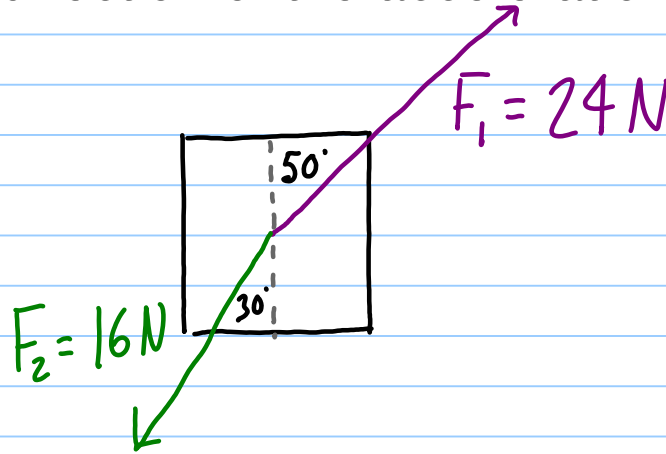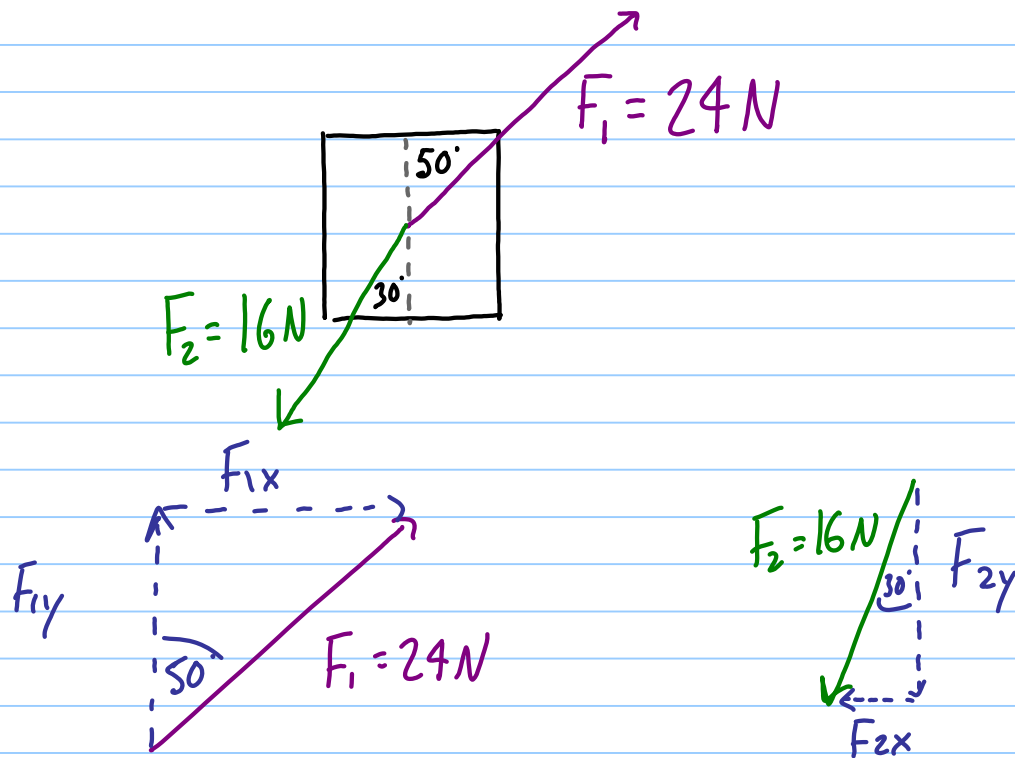
Two forces act on a 2.0 kg block as shown. Determine the magnitude and direction of the acceleration on the block.

$F_1 = 24\,N$

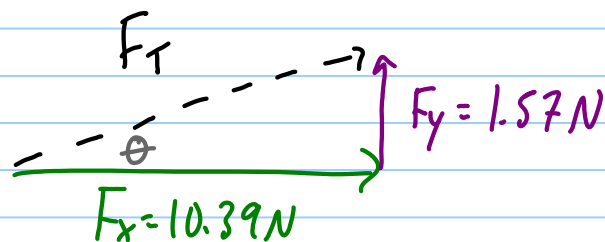$F_2 = 16\,N$

$50°$

$30°$

$F_1 = 24\,N$

$F_2 = 16\,N$

$50°$

$30°$

F_{1x}

F_{1y}

50

$F_1 = 24\,N$

$F_2 = 16\,N$

30

F_{2y}

F_{2x}

$F_{1x} = F_1 \sin 50° = 18.39\,N$

$F_{1y} = F_1 \cos 50 = 15.43\,N$

$F_{2x} = 16 \sin 30° = -8\,N$

$F_{2y} = 16 \cos 30° = -13.86\,N$

$$\textstyle\sum F_x = F_{1x} + F_{2x} = 18.39 + (-8) = 10.39\,N$$

$$\textstyle\sum F_y = F_{1y} + F_{2y} = 15.43 + (-13.86) = 1.57\,N$$

F_T

θ

$F_y = 1.57\,N$

$F_x = 10.39\,N$

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

$$= 10.5\,N$$

$$\theta = \tan^{-1}\left(\frac{1.57}{10.39}\right)$$

$$= 8.6° \ (N.\ of\ E)$$