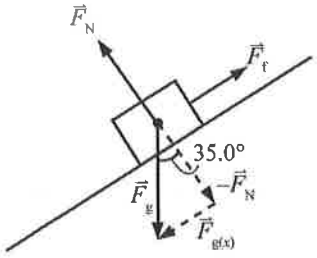
3.



$$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\sin 35.0° = \frac{F_{g(x)}}{275\text{ N}}$$

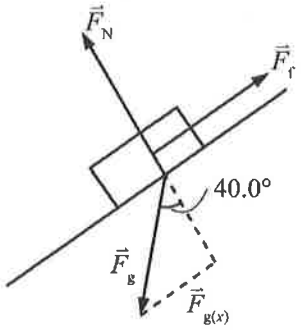
$$F_{g(x)} = (275\text{ N})(\sin 35.0°)$$
$$= 158\text{ N}$$

$$F_{net} = F_{g(x)} - F_{fr}$$
$$= 158\text{ N} - 96.0\text{ N}$$
$$= 62.0\text{ N}$$

$$F_g = mg$$
$$m = \frac{F_g}{g}$$
$$= \frac{275\text{ N}}{9.81\text{ m/s}^2}$$
$$= 28.0\text{ kg}$$

$$F_{net} = ma$$
$$a = F_{g(x)}$$
$$= \frac{62.0\text{ N}}{28.0\text{ kg}}$$
$$= 2.21\text{ m/s}^2$$

4.



$$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\sin 40.0° = \frac{F_{g(x)}}{F_g}$$

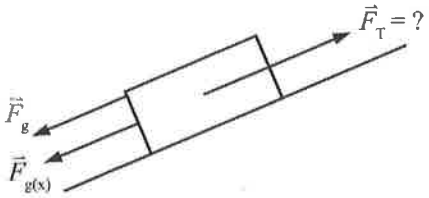
$$F_{g(x)} = (435\text{ N})(\sin 40.0°)$$
$$= 280\text{ N}$$

$$F_g = mg$$
$$m = \frac{F_g}{g}$$
$$= \frac{435\text{ N}}{9.81\text{ m/s}^2}$$
$$= 44.3\text{ kg}$$

$$F_{net} = ma$$
$$= (44.3\text{ kg})(0.250\text{ m/s}^2)$$
$$= 11.1\text{ N}$$

$$F_{net} = F_{g(x)} - F_{fr}$$
$$F_{fr} = F_{g(x)} - F_{net}$$
$$= 280\text{ N} - 11.1\text{ N}$$
$$= 269\text{ N}$$

5.



$$F_{fr} = \mu F_N = \mu F_g \cos\theta$$
$$= (0.180)(125\text{ N})(\cos 23.0°)$$
$$= 20.7\text{ N}$$

$$F_{g(x)} = F_g \sin\theta$$
$$= (125\text{ N})(\sin 23.0°)$$
$$= 48.8\text{ N}$$

$$F_T = F_f + F_{g(x)}$$
$$F_T = 20.7\text{ N} + 48.8\text{ N}$$
$$= 69.5\text{ N}$$

6. **a)** Find magnitude of weight of hanging mass:

$$F_{g1} = m_1 g$$
$$= (2.0\text{ kg})(9.81\text{ m/s}^2)$$
$$= 19.6\text{ N}$$

Find the *Fx* component of the mass on the incline:

$$F_{g2(x)} = F_{g2}\sin\theta$$
$$= m_2 g\sin\theta$$
$$= (1.0\text{ kg})(9.81\text{ m/s}^2)(\sin 30.0°)$$
$$= 4.9\text{ N}$$

$$F_{net} = 19.6\text{ N} - 4.9\text{ N}$$
$$= 14.7\text{ N}$$