The net force is acting along north.

$$\vec{F}_{net} = m\vec{a}$$

$$\vec{a} = \frac{\vec{F}_{net}}{m}$$

$$= \frac{1.1\times10^{2}\text{ N north}}{1.0\times10^{1}\text{ kg}}$$

$$= 1.1\times10^{1}\text{ m/s}^2\text{ north}$$

12. $F_{net} = ma$

$$= (7.0\text{ kg})(2.3\text{ m/s}^2)$$

$$= 16\text{ N}$$

13. $F_{net} = ma$

$$a = \frac{F_{net}}{m}$$

$$= \frac{1.80\times10^{4}\text{ N}}{1.5\times10^{3}\text{ kg}}$$

$$= 1.2\times10^{1}\text{ m/s}^2$$

$$v^2 = v_0^2 + 2ad$$

$$0 = (24.0\text{ m/s})^2 + 2(1.2\times10^{1}\text{ m/s}^2)d$$

$$d = 24.0\text{ m}$$

14. $\vec{F}_{net} = \vec{F}_{fr} = m\vec{a}$

$$a = \frac{\vec{F}_{fr}}{m}$$

$$= \frac{-2.5\times10^{4}\text{ N}}{1.2\times10^{3}\text{ kg}}$$

$$= -21\text{ m/s}^2$$

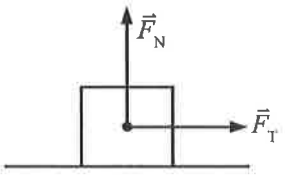
$$\vec{a} = \frac{\vec{v} - \vec{v}_0}{t}$$

$$-21\text{ m/s} = \frac{\vec{v} - 20.0\text{ m/s}}{0.50\text{ s}}$$

$$\vec{v} = +9.6\text{ m/s}$$

$$= 9.6\text{ m/s east}$$

15.



$$F_{net} = F_T = F_g = mg$$

$$= (1.5\text{ kg})(9.81\text{ m/s}^2)$$

$$= 14.7\text{ N}$$

Again $F_{net} = ma$

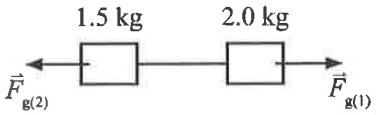
Therefore,

$$a = \frac{F_{net}}{m}$$

$$= \frac{14.7\text{ N}}{2.5\text{ kg}}$$

$$= 5.9\text{ m/s}^2$$

16.



$$F_{net} = F_{g(1)} - F_{f(2)}$$

$$= m_1 g - m_2 g$$

$$= (2.0\text{ kg})(9.81\text{ m/s}^2) - (1.5\text{ kg})(9.81\text{ m/s}^2)$$

$$= 4.9\text{ N}$$

$$F_{net} = ma$$

$$a = \frac{F_{net}}{m}$$

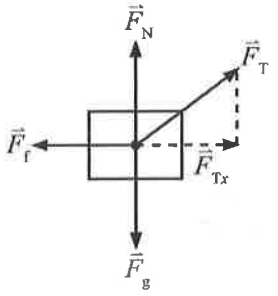
$$= \frac{4.9\text{ N}}{3.5\text{ kg}}$$

$$= 1.4\text{ m/s}^2$$

a) Acceleration of the 1.5 kg mass is1.4 m/s^2

b) Acceleration of the 2.0 kg mass is –1.4 m/s^2

17.



$$F_{Tx} = F_T(\cos 42.0°)$$

$$= (60.0\text{ N})(\cos 42.0°)$$

$$= 44.6\text{ N}$$

$$F_g = mg$$

$$m = \frac{F_g}{g}$$

$$= \frac{125\text{ N}}{9.81\text{ m/s}^2}$$

$$= 12.7\text{ kg}$$