

ANSWERS AND SOLUTIONS

8. Newton's Third Law tells us that for every action (force) there is an equal but *opposite* reaction (force).

C is the answer.

9. Mass is defined as the quantitative measure of an object's inertia.

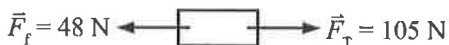
A is the answer.

10.  $\vec{F}_{\text{net}} = m\vec{a}$

If we know the net force and the acceleration, we see from Newton's Second Law that we can determine the mass.

D is the answer.

11.



$$\begin{aligned} F_{\text{net}} &= F_T - F_f \\ &= 105 \text{ N} - 48 \text{ N} \\ &= 57 \text{ N} \end{aligned}$$

$$\begin{aligned} F_{\text{net}} &= ma \\ a &= \frac{F_{\text{net}}}{m} \\ &= \frac{57 \text{ N}}{95.0 \text{ kg}} \\ &= 0.600 \text{ m/s}^2 \end{aligned}$$

B is the answer.

12.



$$\begin{aligned} F &= F_g \\ &= mg \\ &= (7.5 \text{ kg})(9.81 \text{ m/s}^2) \\ &= 76.36 \text{ N} \end{aligned}$$

$$\begin{aligned} F_{\text{net}} &= F_g = ma \\ a &= \frac{F_{\text{net}}}{m} \\ &= \frac{73.5 \text{ N}}{10.5 \text{ kg}} \\ &= 7.0 \text{ m/s}^2 \end{aligned}$$

Note: Must add the two masses

C is the answer.

13.  $F_g = mg$   
 $m = \frac{F_g}{g}$   
 $= \frac{12.0 \text{ N}}{9.81 \text{ m/s}^2}$   
 $= 1.22 \text{ kg}$

B is the answer.

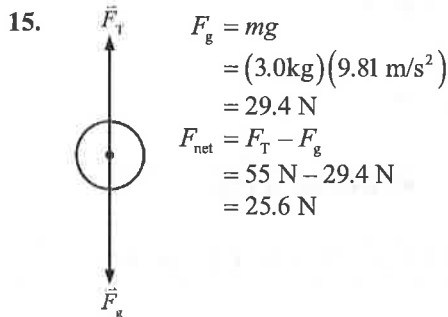
14.

$\vec{v}_0$	$\vec{v}$	$\vec{a}$	$\vec{d}$	$t$
22 m/s	0	?		9.0 s

$$\begin{aligned} \vec{a} &= \frac{\vec{v} - \vec{v}_0}{t} \\ &= \frac{0 - 22 \text{ m/s}}{9.0 \text{ s}} \\ &= -2.44 \text{ m/s}^2 \end{aligned}$$

$$\begin{aligned} \vec{F}_{\text{net}} &= m\vec{a} \\ &= (1.2 \times 10^3 \text{ kg})(-2.44 \text{ m/s}^2) \\ &= -2.9 \times 10^3 \text{ N} \end{aligned}$$

D is the answer.



$$\begin{aligned} F_{\text{net}} &= ma \\ a &= \frac{F_{\text{net}}}{m} \\ &= \frac{25.6 \text{ N}}{3.0 \text{ kg}} \\ &= 8.5 \text{ m/s}^2 \end{aligned}$$

A is the answer.