p. 223 # 1, 2; p. 227 # 1, 3, 4

1. $m = 160\,g$
$= 0.160\,kg$
$\vec{v} = 40.0\,m/s\ [E]$
$\vec{p} = ?$
$E_K = ?$

$\vec{p} = m\vec{v}$
$= (0.160\,kg)(40.0\,m/s\ [E])$
$= 6.40\,kg\,m/s\ [E]$

$E_K = \frac{1}{2}mv^2$
$= \frac{1}{2}(0.160\,kg)(40.0\,m/s)^2$
$= 128\,J$

2. $m_1 = 6.2\,kg$
$v_1 = 1.6\,m/s\ [E]$
$m_2 = 160\,g$
$= 0.160\,kg$
$v_2 = 40.0\,m/s\ [E]$

$\vec{p}_1 = m_1\vec{v}_1$
$= (6.2\,kg)(1.6\,m/s\ [E])$
$= 9.9\,kg\,m/s\ [E]$

$\vec{p}_2 = m_2\vec{v}_2$
$= (0.160\,kg)(40.0\,m/s\ [E])$
$= 6.4\,kg\,m/s\ [E]$

The bowling ball has 3.5 kg m/s more.

1. a) $m = 4.25 \times 10^2\,kg$
$\vec{v} = 6.9\,m/s\ [N]$
$\vec{p} = ?$

$\vec{p} = m\vec{v}$
$= (4.25 \times 10^2\,kg)(6.9\,m/s\ [N])$
$= 2932.5\,kg\,m/s\ [N]$
$= 2.9 \times 10^3\,kg\,m/s\ [N]$

b) $m = 9.97 \times 10^3\,kg$
$\vec{v} = 5\,km/h\ [F] \div 3.6$
$= 1.39\,m/s\ [F]$
$\vec{p} = ?$

$\vec{p} = m\vec{v}$
$= (9.97 \times 10^3\,kg)(1.39\,m/s\ [F])$
$= 13858.3\,kg\,m/s\ [F]$
$= 1 \times 10^4\,kg\,m/s\ [F]$

p. 223 # 1, 2; p. 227 # 1, 3, 4

1c) $m = 995\,g$
$= 0.995\,kg$
$\vec{v} = 16\,m/s\,[S]$
$\vec{p} = ?$

$\vec{p} = m\vec{v}$
$= (0.995\,kg)(16\,m/s\,[S])$
$= 15.92\,kg\,m/s\,[S]$
$= 16\,kg\,m/s\,[S]$

3. $m = 79.3\,kg$
$\vec{p} = 2.16 \times 10^3\,kg\,m/s\,[W]$
$\vec{v} = ?$

$\vec{p} = m\vec{v} \Rightarrow \vec{v} = \frac{\vec{p}}{m}$

$\vec{v} = \frac{2.16 \times 10^3\,kg\,m/s\,[W]}{79.3\,kg}$

$\vec{v} = 27.2\,m/s\,[W]$

4. $\vec{v} = 9.0 \times 10^2\,m/s\,[W]$
$\vec{p} = 4.5\,kg\,m/s\,[W]$
$m = ?$

$\vec{p} = m\vec{v} \Rightarrow m = \frac{\vec{p}}{\vec{v}}$

$m = \frac{4.5\,kg\,m/s\,[W]}{9.0 \times 10^2\,m/s\,[W]}$

$m = 5.0 \times 10^{-3}\,kg.$