Impulse ***SOLUTIONS***

1. a) $p = mv$

$\therefore p = 0.2 \times 12$

$= 2.4$ kgms^{-1}

b) $F = \dfrac{\Delta p}{\Delta t} = \dfrac{2.4}{6 \times 10^{-3}} = 400$N (1 s.f.) to the right

c) 400N (1 s.f.) to the left

$\vec{F}_1 = -\vec{F}_2$

2. $\vec{F} = m\vec{a}$

$\therefore \vec{F} = m\dfrac{\vec{v}_f - \vec{v}_i}{\Delta t}$

$\therefore \vec{F} = \dfrac{m\left(\vec{v}_f - \vec{v}_i\right)}{\Delta t}$

$\therefore \vec{F} = \dfrac{m\vec{v}_f - m\vec{v}_i}{\Delta t}$

$\therefore \vec{F} = \dfrac{\Delta m\vec{v}}{\Delta t}$

$\therefore \vec{F} = \dfrac{\Delta \vec{p}}{\Delta t}$

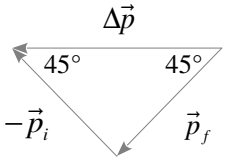
3. 100gs^{-1} (100g per second) is 0.100kg every 1.00 seconds.

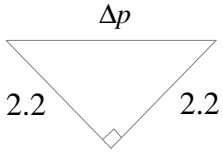
So $m = 0.100$kg and $\Delta t = 1.00$s

$F = \dfrac{\Delta p}{\Delta t} = \dfrac{mv}{\Delta t} = \dfrac{0.100 \times 10}{1.00} = 1.0$N

4.

$\Delta \vec{p} = \vec{p}_f - \vec{p}_i$ $\qquad$ $p = mv = 0.53 \times 4.1 = 2.2$ kgms^{-1}





$\Delta p = \sqrt{2.2^2 + 2.2^2} = 3.1$ kgms^{-1}

The change in momentum is 3.1 kgms^{-1} to the left (away from the wall).