Momentum Problems 2

a.k.a. Conservation of momentum problems

a.k.a. ~~Shut up and write~~

$v = 0$ $v = 0$

object 1   object   1   2

transfer of momentum

① $v = 8\,{}^m/s$ →

$\boxed{500\,kg}$ $v=0$ $\boxed{200\,kg}$ ⚡ $v=0$ $\boxed{500\,kg}$ →$\boxed{200\,kg}$

$p = 4000\,\frac{kg\cdot m}{s}$ $p = 4000\,\frac{kg\cdot m}{s}$

transfer of momentum
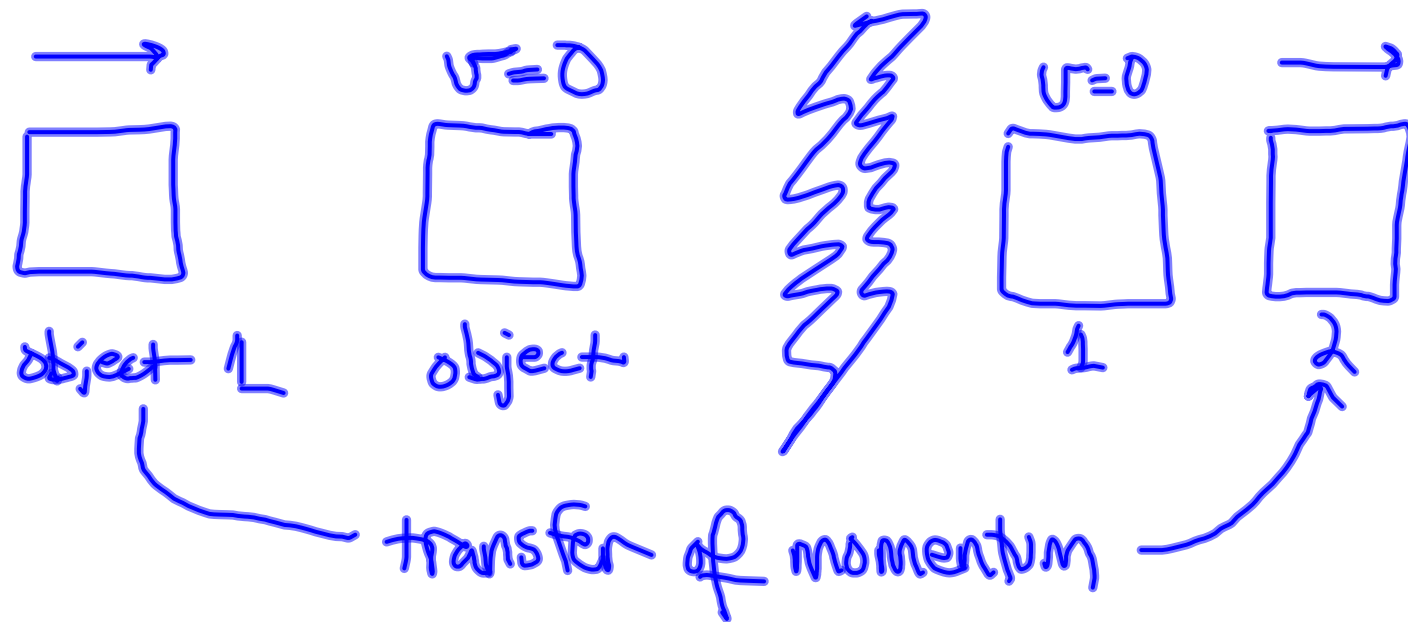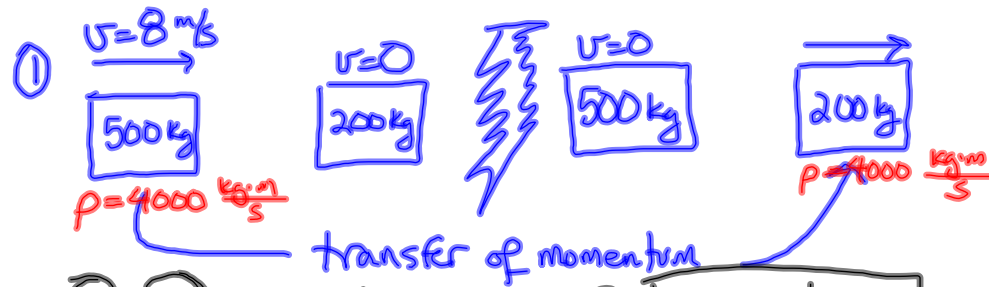
ⓐ ①a $v = 8\,{}^m/s$
$m = 500\,kg$

①b p

② $p = m\cdot v$

③ $p = 500\,kg \cdot 8\,{}^m/s$

④ $p = 500 \cdot 8$
$= \boxed{4000\,\frac{kg\cdot m}{s}}$

⑤ $p = m \cdot v$
$\dfrac{4000}{8} = \dfrac{m \cdot 8}{8}$
$m = 500$ ✓

ⓑ $\boxed{4000\,\frac{kg\cdot m}{s}}$ N

ⓒ ①a $m = 200\,kg$
$p = 4000\,\frac{kg\cdot m}{s}$

①b v

② $p = m \cdot v$

③ $4000\,\frac{kg\cdot m}{s} = 200\,kg \cdot v$

④ $\dfrac{4000}{200} = \dfrac{200 \cdot v}{200}$
$v = \boxed{20\,{}^m/s}$ N

⑤ $p = m \cdot v$
$= 200 \cdot 20$
$= 4000$