Solving Conservation of Momentum Problems!
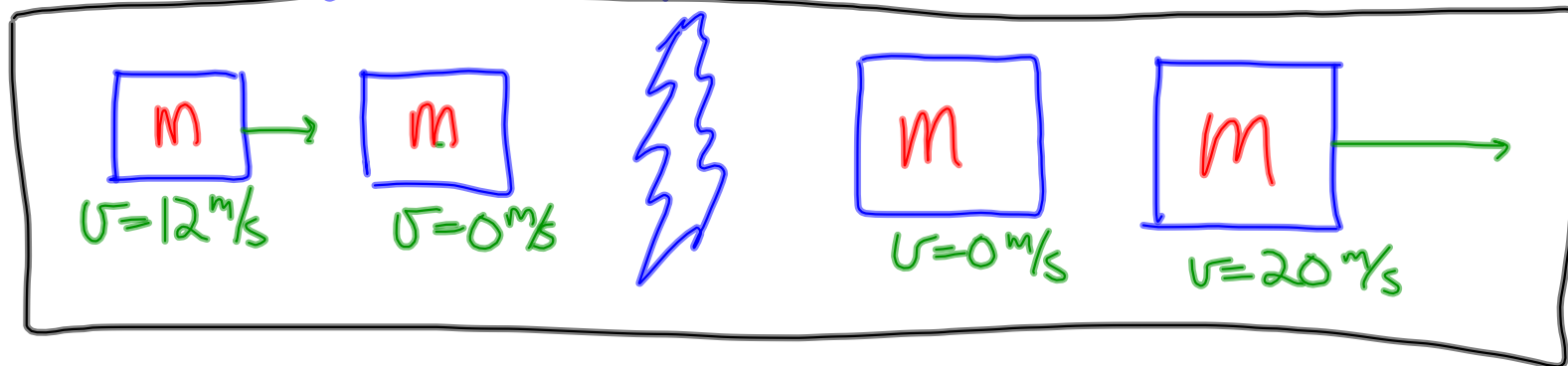
- $P = m \cdot v$
- total momentum before the collision = total momentum after the collision

$v = 12 \, m/s \qquad v = 0 \, m/s \qquad\qquad\qquad v = 0 \, m/s \qquad v = 20 \, m/s$

500kg $\rightarrow$　200kg　　⚡　　500kg　　200kg

8 m/s　　0 m/s　　　　0 m/s　　v

(a) (1a) $m = 500\,kg,\ v = 8\,\frac{m}{s}$

(1b) p

(2) $p = m \cdot v$

(3) $p = 500\,kg \cdot 8\,\frac{m}{s}$ — the same

(4) $p = 500 \cdot 8$

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

(5) $p = m \cdot v$

$\frac{4000}{500} = \frac{500 \cdot v}{500}$

$8 = v$

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

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

(1b) v

(2) $p = m \cdot v$

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

(4) $\frac{4000}{200} = \frac{200 \cdot v}{200}$

$\boxed{v = 20\,\frac{m}{s}}$

(5) $p = 200 \cdot 20$

$= 4000$