Example 4

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Example 4 (Parallel Exercise Group B #24)

4) What is the weight of a 5.00 kg backpack?
b) What is the acceleration of the backpack if a net force of 10.0 N is applied?

a) $m = 5\ kg$

$W = mg$

$W = (5\ kg)(10\ m/s^2)$

$g = 10\ m/s^2$

$W = 50\ N$

b) $m = 5\ kg$, $F = 10N$, $a = ?$

$\frac{F}{m} = \frac{ma}{m}$

$\frac{F}{m} = a$

$a = \frac{F}{m}$

$a = \frac{10\ N}{5\ kg}$ $\quad kg\ m/s^2$

$\boxed{a = 2\ m/s^2}$

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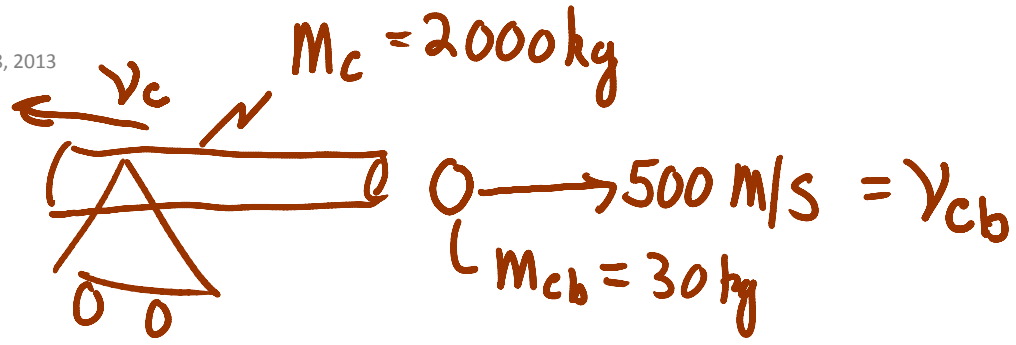

$$p_c = p_{cb}$$

$$\frac{m_c v_c}{m_c} = \frac{m_{cb} v_{cb}}{m_c}$$

$$v_c = \frac{m_{cb}}{m_c} v_{cb}$$

$$v_c = \frac{30\,kg}{2000\,kg}(500\ m/s)$$

$$v_c = \frac{15000\ kg\ m/s}{2000\ kg} = 7.5\ m/s$$