

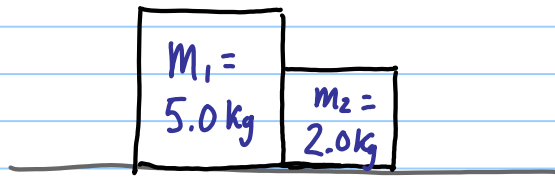
Quiz 1c

Note Title

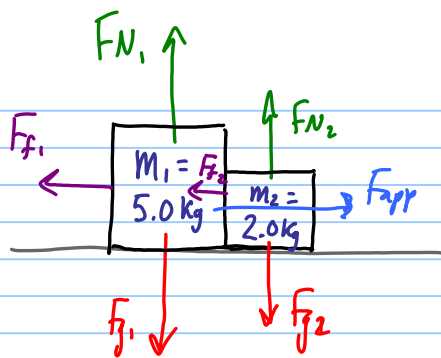
11/10/2011

Two blocks m_1 and m_2 sit side by side on a rough surface with a coefficient of friction of 0.20. m_1 is pushed with a force of 15 N to the right. Find:

- The acceleration of the two blocks.
- The magnitude of force that block m_1 exerts on m_2 .



a)



$$F_{f1} = \mu F_{N1}$$

$$= \mu m_1 g = (0.20)(5.0 \text{ kg})(9.8 \text{ m/s}^2) = 9.8 \text{ N}$$

$$F_{f2} = \mu F_{N2}$$

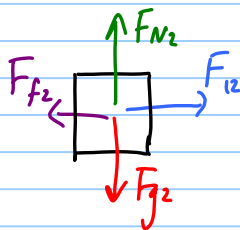
$$= \mu m_2 g = (0.20)(2.0 \text{ kg})(9.8 \text{ m/s}^2) = 3.92 \text{ N}$$

Entire System: $F_{\text{net}} = F_{\text{app}} - F_{f1} - F_{f2} = m_+ a$ ✓

$$a = \frac{F_{\text{app}} - F_{f1} - F_{f2}}{m_+} = \frac{15 - 9.8 - 3.92}{(5.0 + 2.0)}$$

$$= 0.183 \text{ m/s}^2$$
 ✓

b.) m_2 Only!



$$F_{12} - F_{f2} = m_2 a$$
 ✓

$$F_{12} = m_2 a + F_{f2}$$

$$= (2.0 \text{ kg})(0.183 \text{ m/s}^2) + 3.92 \text{ N}$$

$$= \boxed{4.3 \text{ N}}$$
 ✓