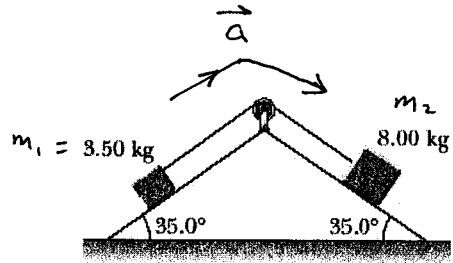


Name: _____

Key

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Two blocks of mass 3.50 kg and 8.00 kg are connected by a massless string that passes over a frictionless pulley as shown in the figure. The inclines are frictionless. Find (a) the magnitude of the acceleration of blocks and (b) the tension in the string.



for m_1



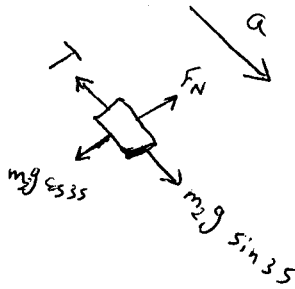
$$\sum F_x = m_1 a_x$$

$$T - m_1 g \sin 35 = m_1 a$$

$$T = 3.5(9.8) \sin 35 + 3.5 a$$

$$T = 19.7 + 3.5 a \quad (1)$$

for m_2



$$\sum F_x = m_2 a$$

$$m_2 g \sin 35 - T = m_2 a$$

$$8(9.8) \sin 35 - T = 8 a$$

$$45 - T = 8 a \quad (2)$$

add (1) + (2) \Rightarrow

$$45 = 19.7 + 3.5a + 8a$$

$$11.5 a = 25.3$$

$$a = \frac{25.3}{11.5} = 2.2 \text{ m/s}^2$$

plug $a = 2.2 \text{ m/s}^2$ in (2) \Rightarrow

$$T = 45 - 8(2.2)$$

$$T = 27.4 \text{ N}$$