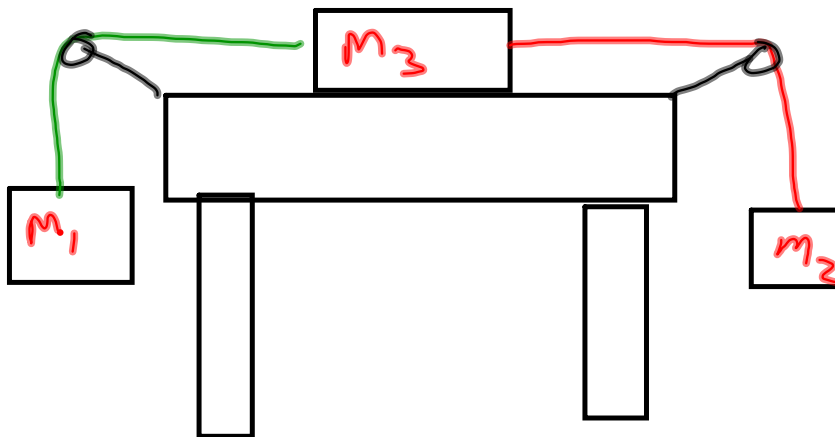


2. A 0.840 kg m_3 is placed on a level surface. The mass is joined by strings to two hanging masses. $m_1 = 4.85\text{ kg}$ and $m_2 = 3.62\text{ kg}$. The picture below might help.
- What is the magnitude and direction for the acceleration of the m_3 if it is released?
 - What is the tension in each string?
 - What is the acceleration of the m_3 if the coefficient of sliding friction between the m_3 and the surface is 0.47 ?
 - What is the tension in each string?



2. A 0.840 kg mass₃ is placed on a level surface. The mass is joined by strings to two hanging masses. mass₁ = 4.85 kg and mass₂ = 3.62 kg . The picture below might help.
- What is the magnitude and direction for the acceleration of the mass₃ if it is released? $1.3 \text{ m/s}^2 \leftarrow$
 - What is the tension in each string? $T_1 = 41.3 \quad T_2 = 40.2$
 - What is the acceleration of the mass₃ if the coefficient of sliding friction between the mass₃ and the surface is 0.47 ? $.88$
 - What is the tension in each string? $T_1 = 43.3 \text{ N} \quad T_2 = 38.4 \text{ N}$

$$F_{\text{Tot}} = 47.6 - 35.5 = 12.1 \text{ N}$$

$$12.1 \text{ N} = (m_1 + m_2 + m_3) a$$

$$a = 1.3 \text{ m/s}^2$$

$$m_1 a = m_1 g - T_1$$

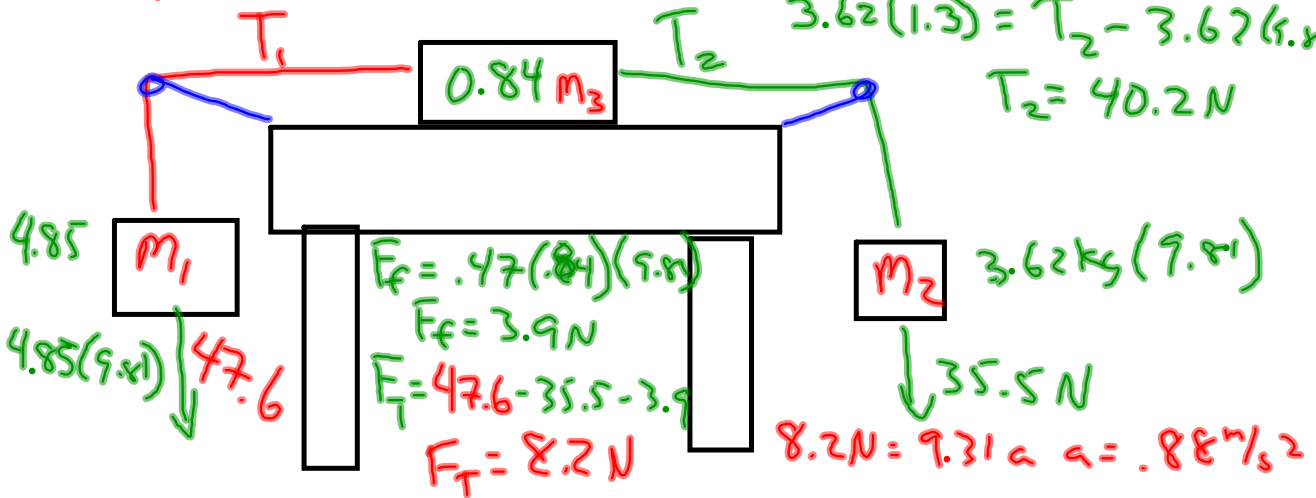
$$4.85(1.3) = 4.85(9.8) - T_1$$

$$T_1 = 41.3 \text{ N}$$

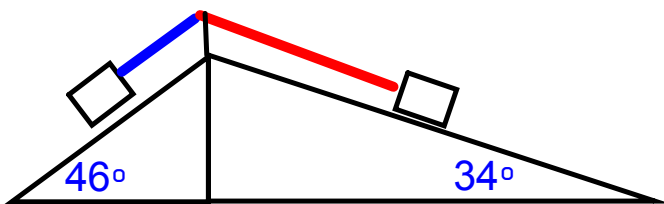
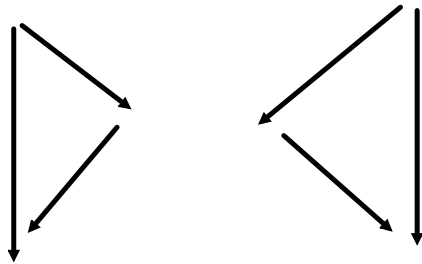
$$m_2 a = T_2 - m_2 g$$

$$3.62(1.3) = T_2 - 3.62(9.8)$$

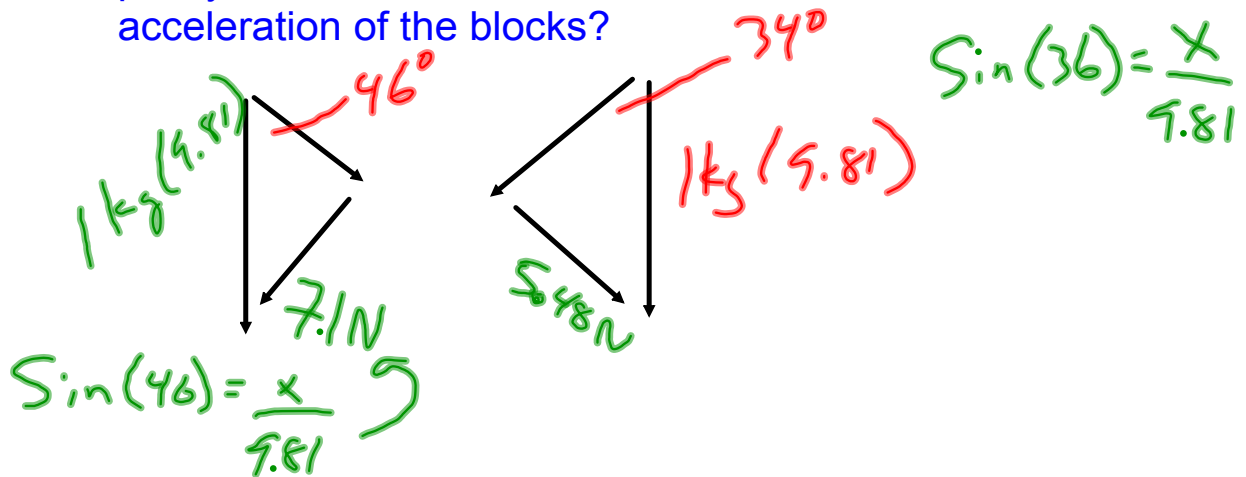
$$T_2 = 40.2 \text{ N}$$



79) Two 1kg blocks are connected by a string passing over a pulley. The inclined surfaces are frictionless. What is the acceleration of the blocks?



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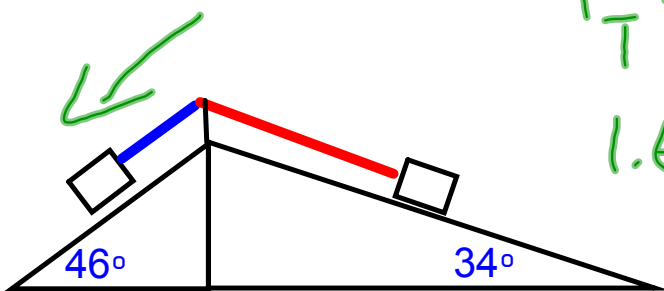


$$F_T = 7.1\text{ N} - 5.48\text{ N}$$

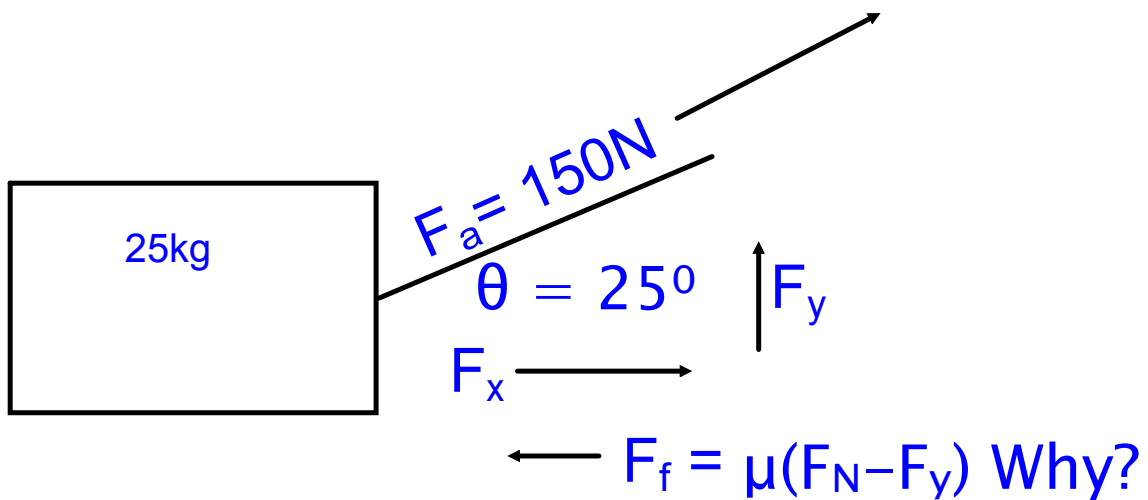
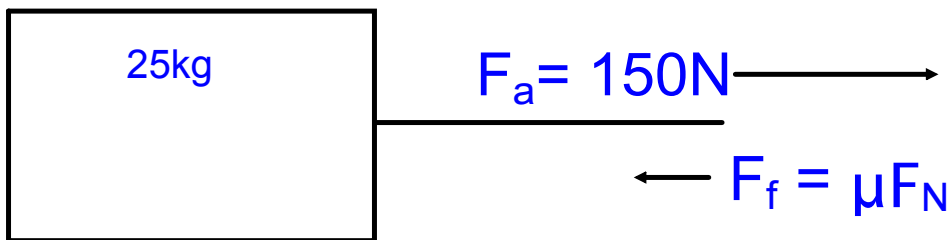
$$F_T = 1.6\text{ N}$$

$$1.6\text{ N} = 2(a)$$

$$a = 0.81\text{ m/s}^2$$

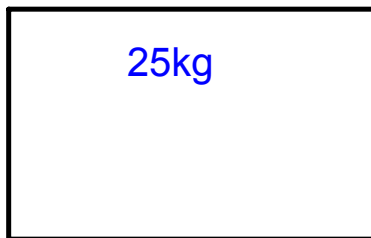


You pull a 25kg box across a floor with a coefficient of sliding friction of 0.25. what is the acceleration for the two cases shown below?



You pull a 25kg box across a floor with a coefficient of sliding friction of 0.25. what is the acceleration for the two cases shown below?

$$F_{TOT} = F_a - F_f = 150 - 61 = 89N$$



$$F_a = 150N$$

$$F_f = \mu F_N$$

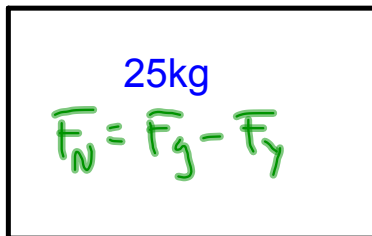
$$89N = 25(a)$$

$$a = 3.56 m/s^2$$

$$F_f = 0.25(25)(9.81) = 61N$$

$$F_T = F_x - F_f = 90.5 = 25(a)$$

$$a = 3.62 m/s^2$$



$$F_a = 150N$$

$$\theta = 25^\circ$$

$$F_x$$

$$F_x = (\cos(25))(150) = 136N$$





$$F_y = \sin(25)(150N) = 63.4N$$

$$F_N = 25(9.81) - 63.4N = 182N$$

$$F_f = \mu(F_N - F_y) \text{ Why?}$$

$$182(.25) = 45.5N$$

Attachments

-  pulleys
-  friction and tension
-  ramp demo with friction
-  solution to problem