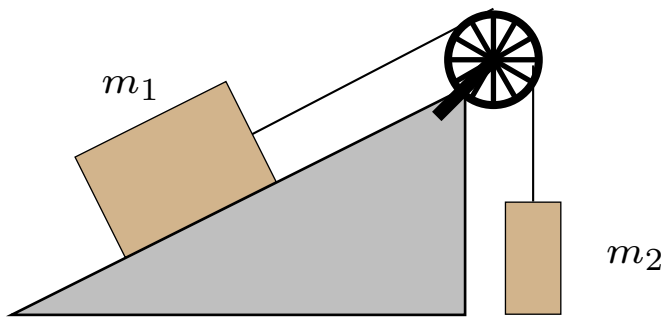
Question 1

Two blocks are connected as illustrated. The surfaces are frictionless and the pulley is massless. Suppose that the acceleration of the block on the ramp was known to be $4.0\,\mathrm{m/s^2}$ up the ramp and one wanted to obtain the tension, T, in the rope.

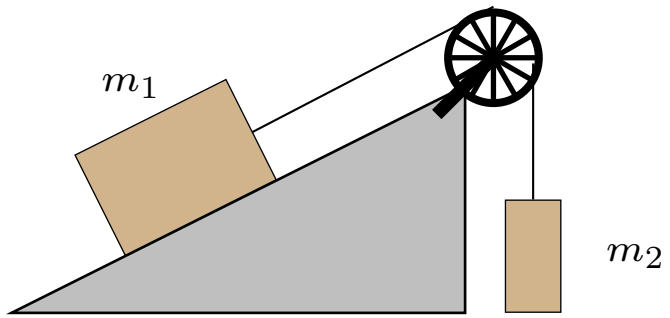


Using tilted axes with x along the ramp, which of the following would be correct for the block on the ramp?

1. $\sum F_x = (m_1)4.0\,\mathrm{m/s^2}$
2. $\sum F_x = (m_1)9.8\,\mathrm{m/s^2}$
3. $\sum F_x = (m_1)(4.0\,\mathrm{m/s^2} + 9.8\,\mathrm{m/s^2})$
4. $\sum F_x = (m_1)(4.0\,\mathrm{m/s^2} - 9.8\,\mathrm{m/s^2})$
5. $\sum F_x = (m_1 + m_2)4.0\,\mathrm{m/s^2}$

Question 2

Two blocks are connected as illustrated. The surfaces are frictionless and the pulley is massless. Suppose that the acceleration of the block on the ramp was known to be a up the ramp and one wanted to obtain the tension, T, in the rope.

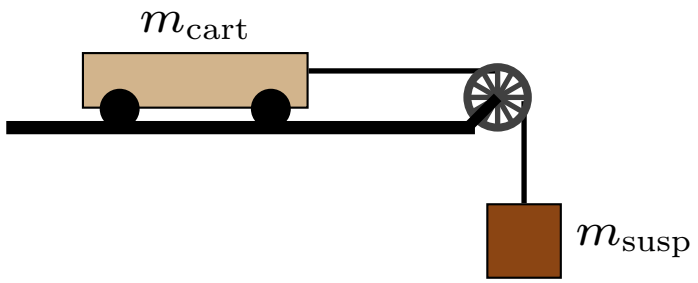


Using tilted axes with x along the ramp, which of the following would be correct for the block on the ramp?

1. $T > m_1 a$
2. $T < m_1 a$
3. $T = m_1 a$

Question 3

A cart is connected to a suspended mass as illustrated. A hand gives the cart a brief, strong push to the left. After the cart leaves the hand it continues to move to the left for a while.



Which of the following is true about the tension in the string after the cart has left the hand and while it moves left?

1. $T = m_{\text{susp}}g$
2. $T < m_{\text{susp}}g$
3. $T > m_{\text{susp}}g$