

Question 1

Two ropes pull on a block of mass m that moves along a horizontal frictionless surface as illustrated.



Which of the following is true regarding the normal force exerted by the horizontal surface on the block?

1. $n = mg$
2. $n < mg$
3. $n > mg$

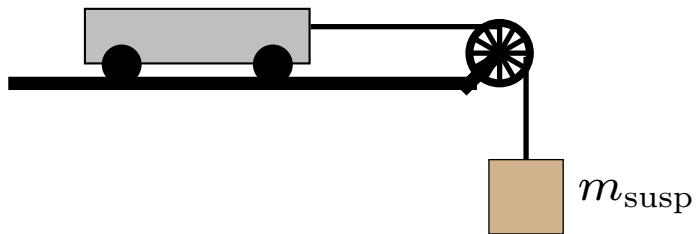
Question 2

Ethel is at rest in a chair, which has wheels and can roll across the floor. She is next to a desk, which also has wheels and can roll across the floor. The desk is at rest and has 10 times the mass of Ethel and the chair together. Ethel pushes against the desk and is propelled away from the desk. Which of the following is true while Ethel pushes against the desk?

1. The desk exerts a force on Ethel; Ethel exerts an equal force on the desk.
2. The desk exerts a force on Ethel; Ethel exerts a larger force on the desk.
3. The desk exerts a force on Ethel; this is 10 times larger than the force exerted by Ethel on the desk.
4. Neither object exerts a force on the other. Ethel moves because she exerts a force on herself.

Question 3

A cart is connected to a suspended object. 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.

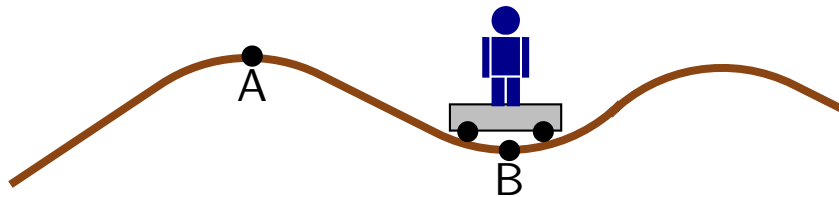


Which of the following is true about the tension in the string after the cart has left the hand and while it moves left?

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

Question 4

A cart carrying a passenger moves along the road whose profile is as illustrated. The passenger stands on a scale, which measures the normal force exerted on the passenger.



Suppose that the cart is moving at location B. How does the scale reading compare to the gravitational force on the person?

1. Same.
2. Larger.
3. Smaller.