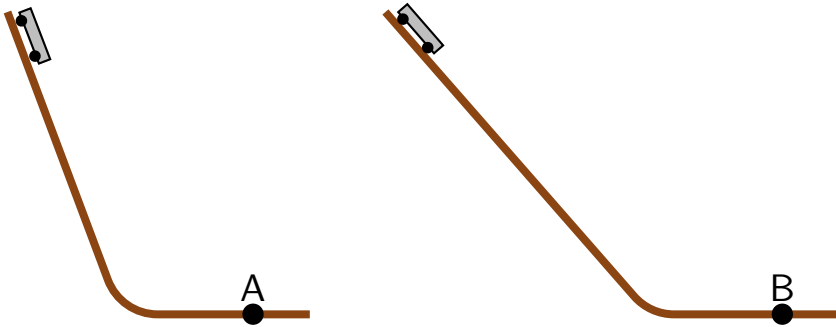


Question 1

Two carts with different masses will be released from the top of either illustrated track. The vertical height of the release position above the base of the track will be the same and there is no friction.

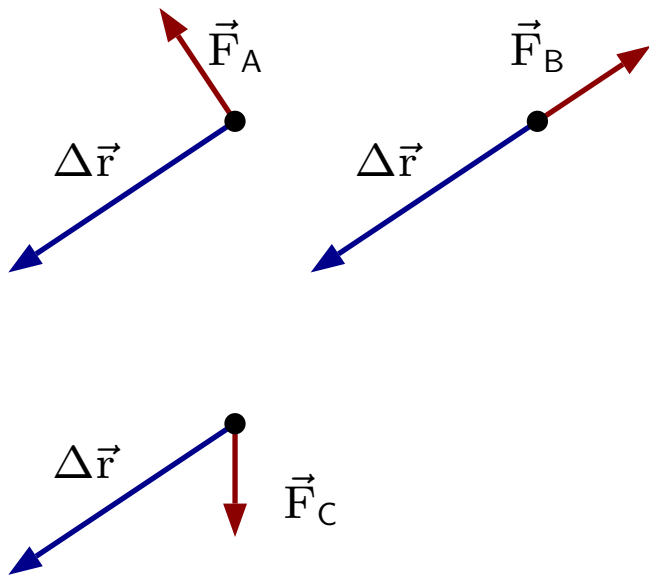


Which of the following is true of the speeds at A and B?

1. Same regardless of which cart is released on which track.
2. Faster at A regardless of which cart is on A.
3. Slower at A regardless of which cart is on A.
4. Slower for the cart with larger mass regardless of track.
5. Faster for the cart with larger mass regardless of track.

Question 2

Three objects have the same displacement while forces of the same magnitude act on them.

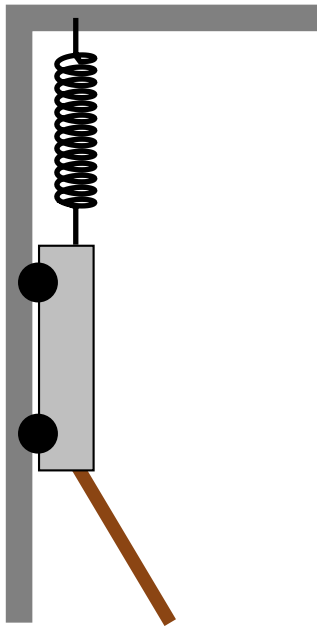


Which of the following represents the rank of the works done by the forces?

1. $W_A = W_B = W_C$
2. $W_B > W_A > W_C$
3. $W_B > W_C > W_A$
4. $W_C > W_B > W_A$
5. $W_C > W_A > W_B$

Question 3

A cart is attached to a track by frictionless rails, which restrict the motion of the cart to the vertical direction. The cart is suspended from the ceiling by a spring.

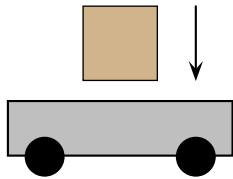


The cart is initially at rest. A rope then pulls the cart with a constant force at an angle from beneath and the cart moves down. Which of the following is true?

1. $W_{\text{spring}} > 0$ and $W_{\text{rope}} > 0$
2. $W_{\text{spring}} > 0$ and $W_{\text{rope}} < 0$
3. $W_{\text{spring}} < 0$ and $W_{\text{rope}} > 0$
4. $W_{\text{spring}} < 0$ and $W_{\text{rope}} < 0$
5. $W_{\text{spring}} = 0$ and $W_{\text{rope}} = 0$

Question 4

An 8 kg cart moves to the right with speed 10 m/s. A 2 kg block is dropped gently onto the cart, so that at the moment before it touches the cart, the block is almost at rest. The block sticks to the cart after it lands.



Which of the following best describes the velocity of the cart and block?

1. 10 m/s \rightarrow
2. 10 m/s \leftarrow
3. 8 m/s \rightarrow
4. 5 m/s \rightarrow
5. 1 m/s \rightarrow
6. 0 m/s