

# Question 1

A man pushes an object across a horizontal sheet of ice, such as in the PhET animation “Forces and Motion”. The man pushes the crate for an initial period of 2 s and after this the crate loses contact with the man’s hand. Which of the following is/are true?

1. The crate can move only *while* the man pushes on it.
2. The crate can move only *after* the man has stopped pushing it.
3. The crate can move while the man pushes on it and after the man has stopped pushing on it.

## Question 2

A man pushes an object across a horizontal sheet of ice, such as in the PhET animation “Forces and Motion”. The man pushes the crate for an initial period of 2 s and after this the crate loses contact with the man’s hand but continues to slide to the right. Which of the following is/are true?

1. The man never exerts a force on the crate.
2. The man exerts a force on the crate during all times that the crate is moving.
3. The man only exerts a force on the crate *during* the initial period of 2 s.
4. The man only exerts a force on the crate *after* the initial period of 2 s.

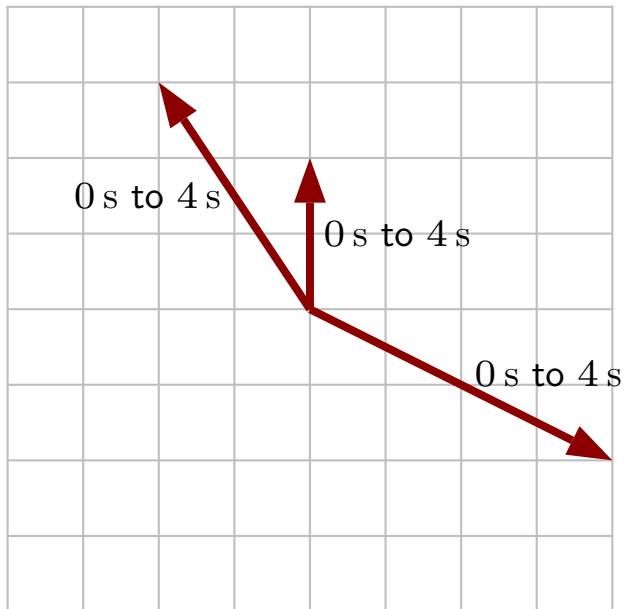
# Warm Up Question 1

King Zog observes a block on a horizontal frictionless surface. The block can be pulled by identical springs, each of which is stretched the same length. He believes that with a single spring the block will move with a constant velocity. He then considers the same block pulled by two such springs pulling in the same direction. He guesses that the block will move with a faster constant velocity than when just one spring is used. What advice would you offer to him regarding the velocity of the block when two springs are attached? Explain your answer.

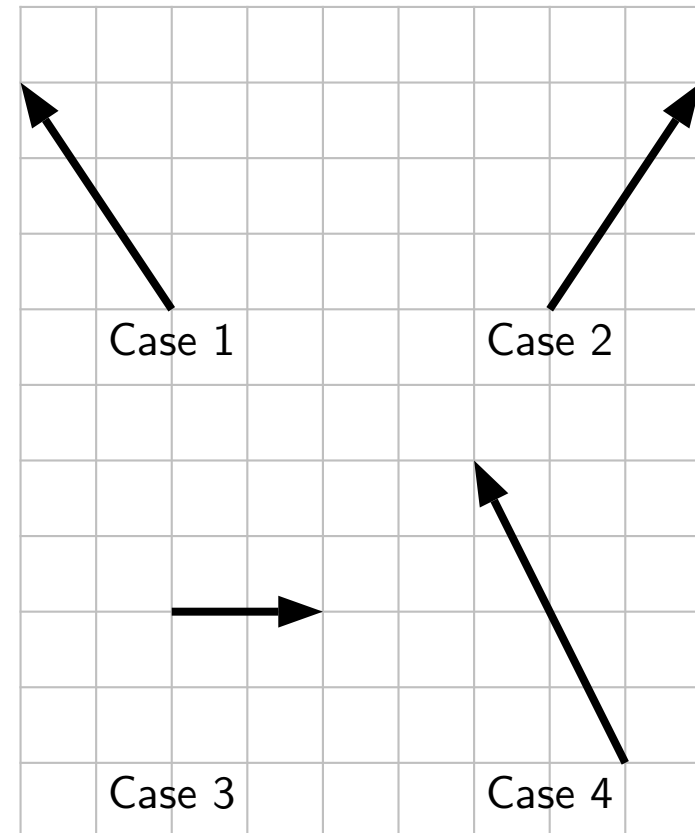
1. Faster velocity with two springs. Force is larger.
2. Same velocity for each since springs are the same.
3. Acceleration is larger with two springs.
4. Velocity would not be constant.

## Question 3

The following force vectors act on one object during various times as indicated.



Which of the following best represents the net force acting on the object from 0 s to 4 s?



## Warm Up Question 2

Two carts are pulled along a horizontal surface. One of the carts is loaded and has five times the mass of the other. During a certain period of time, both carts move in a straight line with the same constant speed. How does the net force on the loaded cart compare (larger, smaller, ...) to that on the other cart during this period? Explain your answer.

1. Smaller on loaded cart.
2. Larger on loaded cart. Same velocity larger mass.
3. Same. Acceleration is zero.