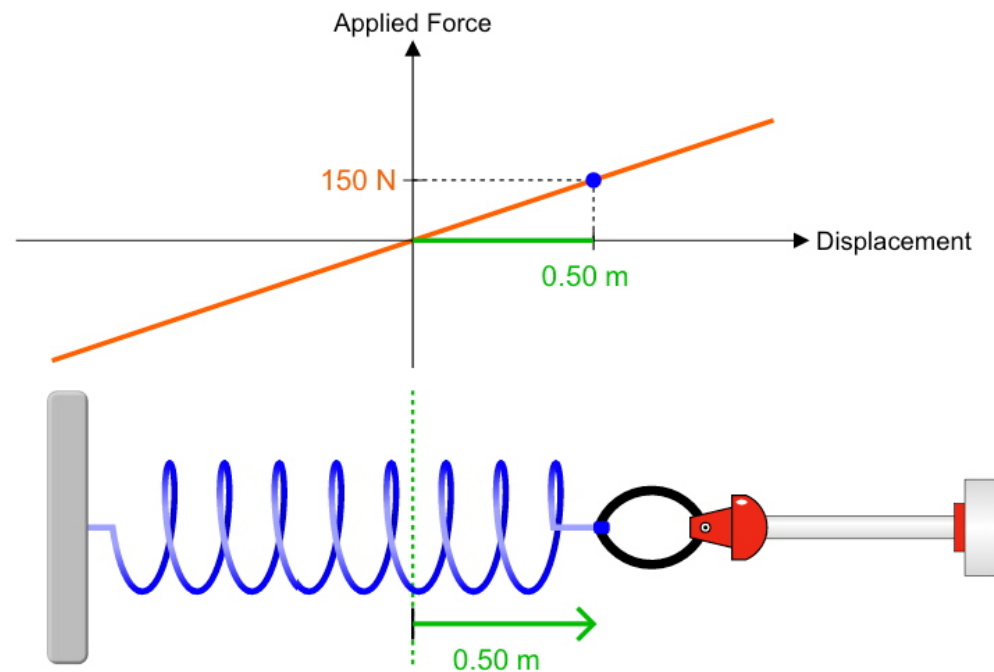


In the figure below is shown a simulation of a force pulling on a spring being stretched by a ring. If the displacement shown is positive, what is the direction of **the force that the spring is exerting on the ring?**



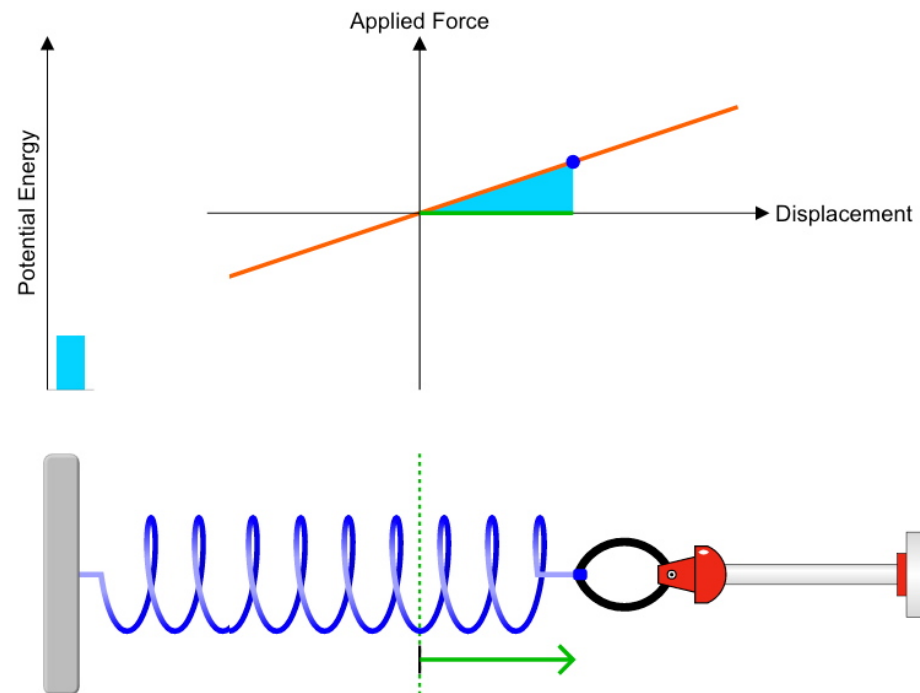
- A. To the left
- B. To the right
- C. Cannot be determined from the information given

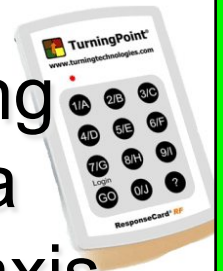


The figure below shows a spring pulled by a ring and represents the area between the force graph and the displacement axis as a positive blue bar on the left – the PE. What does this PE represent?



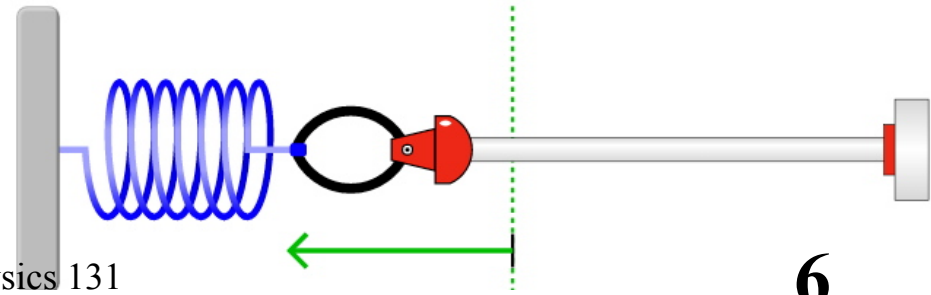
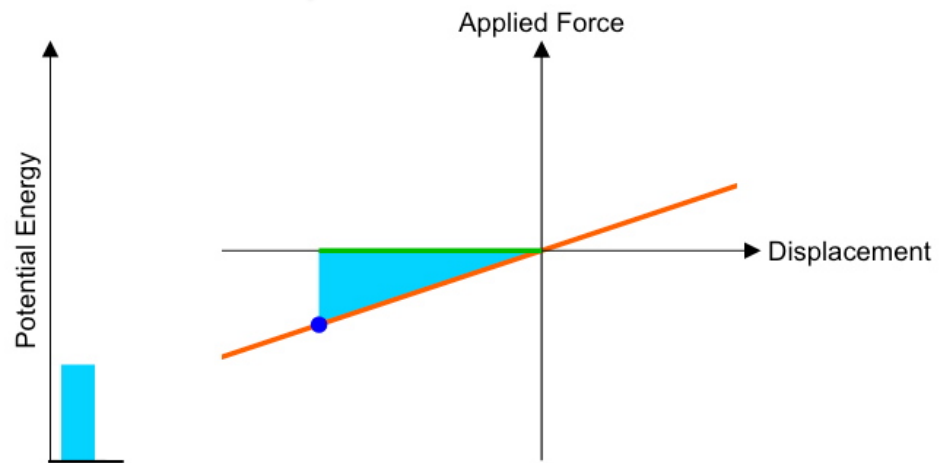
- A. The work done by the ring on the spring.
- B. The negative of the work done by the ring on the spring.
- C. Cannot be determined from the information given.





The figure below shows a spring pushed by a ring (negative displacement) and represents the area between the force graph and the displacement axis as a positive blue bar on the left – the PE. The area shown is below the horizontal axis, but the PE bar is still positive. Is this correct?

- A. Yes
- B. No
- C. Cannot be determined from the information given

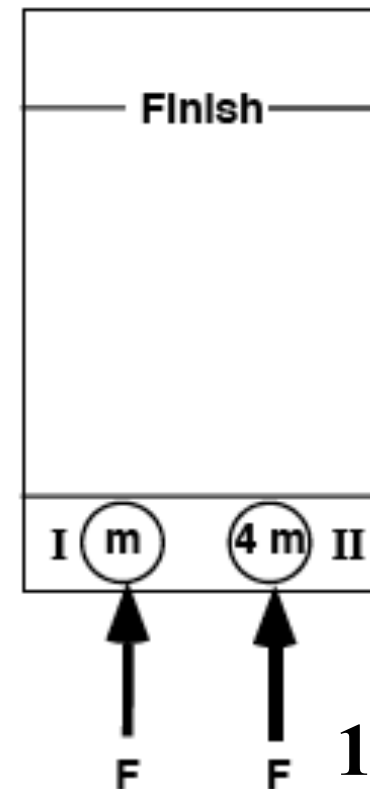




The diagram depicts two pucks on a frictionless table. Puck II is four times as massive as puck I. Starting from rest, the pucks are pushed across the table by two equal forces.

Which puck will have the greater KE upon reaching the finish line?

- A. Puck I
- B. Puck II
- C. Both will have the same.
- D. There is not enough information to decide.

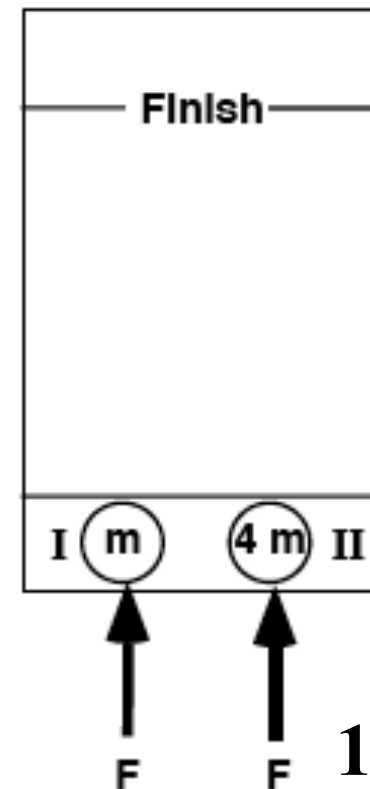




The diagram depicts two pucks on a frictionless table. Puck II is four times as massive as puck I. Starting from rest, the pucks are pushed across the table by two equal forces.

Which puck will have the greater momentum upon reaching the finish line?

- A. Puck I
- B. Puck II
- C. Both will have the same.
- D. There is not enough information to decide.



Each row in the following table pairs a force vector with a corresponding displacement, resulting in work  $W$  being done. In which of these rows is  $W = 0$ ?



MULTI

	$\vec{F}$	$\Delta\vec{r}$
1.	$\rightarrow$	$\leftarrow$
2.	$\leftarrow$	$\leftarrow$
3.	$\uparrow$	$\rightarrow$
4.	$\swarrow$	$\rightarrow$
5.	$\downarrow$	$\swarrow$

*What does  $W = 0$  imply about the object's speed?*

Each row in the following table pairs a force vector with a corresponding displacement resulting in work  $W$  being done. In which of these rows is  $W > 0$ ?



MULTI

	$\vec{F}$	$\Delta\vec{r}$
1.	$\rightarrow$	$\leftarrow$
2.	$\leftarrow$	$\leftarrow$
3.	$\uparrow$	$\rightarrow$
4.	$\swarrow$	$\rightarrow$
5.	$\downarrow$	$\swarrow$

*What does  $W > 0$  imply about the object's speed?*



MULTI

A box is pulled along a horizontal surface with a constant force  $T$ . It moves at a constant velocity and passes first position A and then B. The force of friction  $f$  cannot be neglected. Which of the following statements is true? (Give all the correct answers.)

- A. The work done on the box by the gravitational force is non-zero.
- B. The work done on the box by  $f$  is positive.
- C. The total work done on the box by the net force is non-zero.
- D. The magnitude of the work done on the box by  $T$  is equal to the magnitude of the work done by  $f$ .
- E. The magnitude of  $T$  is greater than the magnitude of  $f$ .

