

## Cycle 1 – First Law Review

According to the First Law of Motion, objects should continue to move at a constant speed in the same direction if the net force is zero.

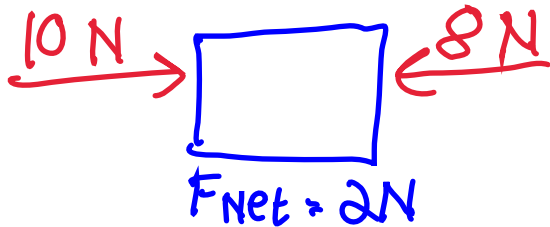
The Moon orbits the Earth - in other words, it is turning in a circle around the Earth. What must you conclude about the situation (as Newton did many years ago)?

**There is an external force that is causing the moon to change direction. This external force is gravity from the Earth**

Two 5 Newton forces act horizontally on a block on a table. Under what circumstances would the block be at rest? Under what circumstances would the block move at a constant velocity? Under what circumstances would the block speed up?



There are two forces on an object. One is 10 N, the other is 8 N. What is the largest Net Force the object could have? What is the smallest Net Force the object could have? Sketch both situations.



Which of the force configurations below are consistent with...

a) Constant speed. b) Stopped and staying stopped. c) Changing speed.

I  c	II  a, b	III  c	IV  (no forces)
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a, b

Determine if the following are a mass or a weight thing.

Mass?	Weight?	Situation
	X	Lifting a water bucket off the ground
X		It hurts to get hit with a baseball on the International Space Station
X		It takes more fuel to accelerate a truck sideways on a road that it does to accelerate a car sideways on the road.

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Circle if the object will work fine, work different, or not work on the Moon and the International Space Station (ISS) and explain why!

*Answers vary*

Object	Moon	ISS	Why?
Parachute	<ul style="list-style-type: none"> <li>- Works Fine</li> <li>- Works Differently</li> <li>- Doesn't work</li> </ul>	<ul style="list-style-type: none"> <li>- Works Fine</li> <li>- Works Differently</li> <li>- Doesn't work</li> </ul>	
Bungie Chord	<ul style="list-style-type: none"> <li>- Works Fine</li> <li>- Works Differently</li> <li>- Doesn't work</li> </ul>	<ul style="list-style-type: none"> <li>- Works Fine</li> <li>- Works Differently</li> <li>- Doesn't work</li> </ul>	
Flashlight	<ul style="list-style-type: none"> <li>- Works Fine</li> <li>- Works Differently</li> <li>- Doesn't work</li> </ul>	<ul style="list-style-type: none"> <li>- Works Fine</li> <li>- Works Differently</li> <li>- Doesn't work</li> </ul>	

Fill in the unknowns for the following situations.

F <sub>net</sub>	direction
15 N	→

30 N

15 N ←

☐ staying stopped.  
☐ constant speed.  
☐ gaining speed.  
☒ losing speed.

←..... was moving

F <sub>net</sub>	direction
10 N	→

60 N →

50 N

☐ staying stopped.  
☐ constant speed.  
☒ gaining speed.  
☐ losing speed.

was moving.....→

F <sub>net</sub>	direction
<u>0</u>	<u>—</u>

20 N →

20 N ←

☒ staying stopped.  
☐ constant speed.  
☐ gaining speed.  
☐ losing speed.

This object is currently not moving.

F <sub>net</sub>	direction
<u>10 N</u>	<u>←</u>

15 N →

25 N ←

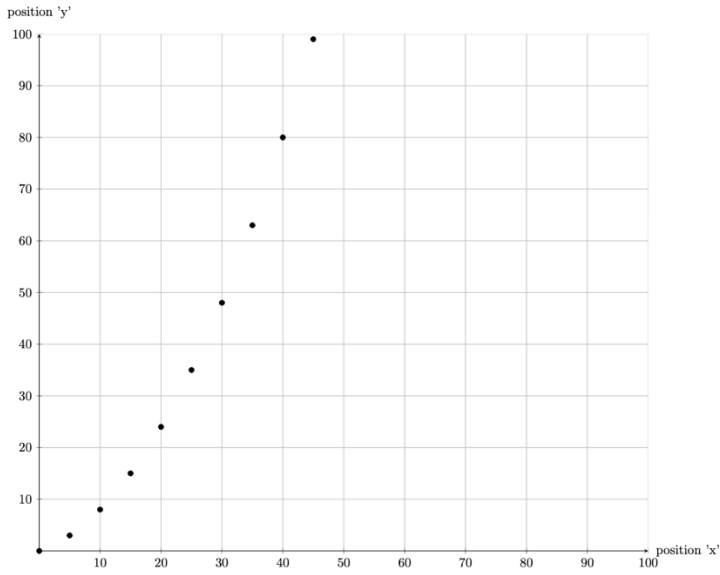
☐ staying stopped.  
☐ constant speed.  
☒ gaining speed.  
☐ losing speed.

←..... was moving

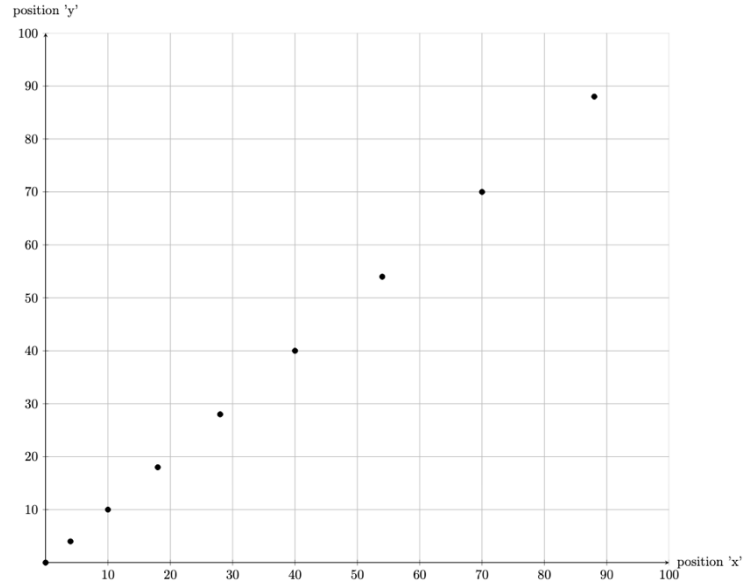
# Cycle 1 – First Law Review

Which direction(s) are experiencing an acceleration in the following scenarios?

*Both*



*y-direction*



Determine if the following dot patterns correspond to a net force being present or not!

	<p><i>NO net force present</i></p> <p>Net Force present</p>	
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## Cycle 1 – First Law Review

Sketch out what a dot pattern would look like for a rocket that...

Has its thrusters turned off drifting in deep space.

Start  End

Has its thrusters turned on in deep space. (could be two answers). Describe which one would be which.

Start  End ← Gaining speed

Start  End ← losing speed