

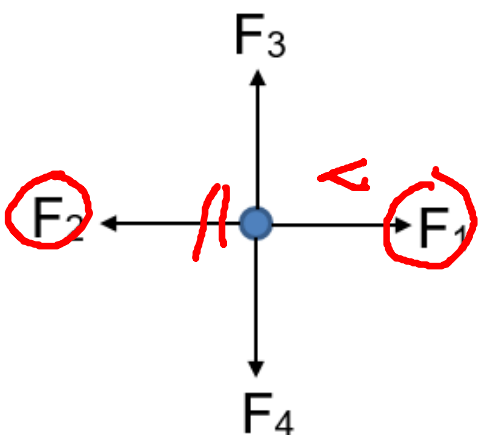
$$F_{net} = ma \quad F_g = mg \quad g = 9.8 \text{ m/s}^2$$

1. A net force is required when you want to cause an object to..... **(Select all that apply)**

accelerate = changing velocity

- a. speed up.
- b. keep moving at a constant velocity.
- c. come to a stop.
- d. stay at rest.
- e. change directions.

2. The diagram below shows a cart that is accelerated to the right. Which of the following correctly represents the forces acting on the cart?



- a. $F_1 = F_2, F_3 = F_4$
- b. $F_1 > F_2, F_3 < F_4$
- c. $F_1 < F_2, F_3 = F_4$
- d. $F_1 > F_2, F_3 = F_4$
- e. $F_1 = F_2, F_3 > F_4$

3. A rock has a weight of 81.5 N when it is loaded onto the lunar lander on the moon where the acceleration due to gravity is 1.63 m/s². What is the mass of the rock?

$$F_g = mg$$

$$81.5 = m(1.63)$$

$$m = 50 \text{ kg}$$

What is the weight of the rock when it is unloaded on earth?

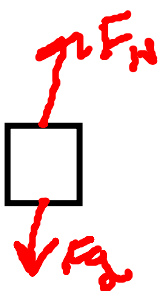
$$F_g = mg = 50(9.8) = \underline{490 \text{ N}}$$

4. Which of the following would properly measure your mass both on the moon and on earth?

- ~~a.~~ A ~~force~~ probe like the one we used in lab.
- ~~b.~~ An electronic scale.
- c. A balance that has masses on both sides of a pivot.
- ~~d.~~ A bathroom scale.

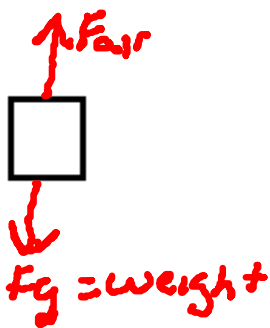
5. Inertia is the property of mater that resists changes in motion of an object.

6. Draw a Free body diagram of a person standing on a bathroom scale. What accounts for the value your weight that you read in the display?



- The scale is reading the normal force that it is applying to you. The scale pushes back on you equal to your weight.

7. A leaf (weighing 1.0 N) is falling from a tree at constant velocity. Draw the FBD of the leaf.



- Write the F_{net} equation for the leaf.

$$F_{net} = 0 \quad F_{net} = 0$$

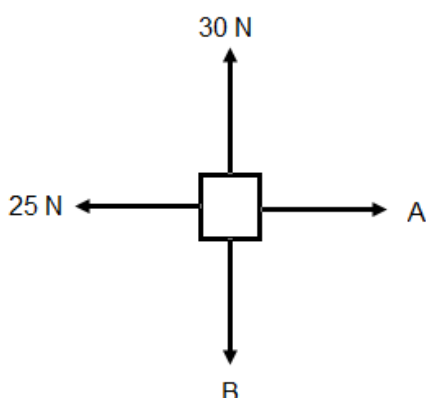
$$F_{air} - F_g = 0$$

- What is the force of air resistance?

$$F_{air} - F_g = 0$$

$$F_{air} - 1.0 = 0 \quad F_{air} = 1N$$

8. The object below has a net force of 15 N to the right. What are the values of A and B?



$$F_{y\ net} = 0$$

$$30 - B = 0$$

$$\underline{B = 30}$$

$$F_{x\ net} = 15$$

$$A - 25 = 15$$

$$\underline{A = 40\ N}$$