Instructions: Complete these problems on separate paper. On ALL questions (yes, even multiple choice), you must:
1. *Draw a picture or diagram* to visualize the problem
2. *Show each step of your calculations clearly*
3. *Write a few sentences* explaining important steps and discussing the reasonableness of your result.

It is ok to collaborate with your peers, but the work must be your own.

You must take assignments seriously to learn physics

1.

A net force of 25 newtons is applied horizontally to a 10.-kilogram block resting on a table. What is the magnitude of the acceleration of the block?

(1) 0.0 m/s^2 (3) 0.40 m/s^2
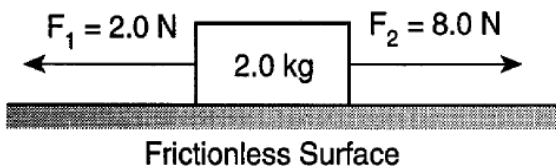
(2) 0.26 m/s^2 (4) 2.5 m/s^2

2.

A net force of 10. newtons accelerates an object at 5.0 meters per second². What net force would be required to accelerate the same object at 1.0 meter per second²?

(1) 1.0 N   (3) 5.0 N

(2) 2.0 N   (4) 50. N

3.

Two forces are applied to a 2.0-kilogram block on a frictionless, horizontal surface, as shown in the diagram below.

$F_1 = 2.0 \text{ N}$ 2.0 kg $F_2 = 8.0 \text{ N}$

Frictionless Surface

The acceleration of the block is

(1) 5.0 m/s^2 to the right
(2) 5.0 m/s^2 to the left
(3) 3.0 m/s^2 to the right
(4) 3.0 m/s^2 to the left

4.

What is the magnitude of the net force acting on a 2.0×10^3-kilogram car as it accelerates from rest to a speed of 15 meters per second in 5.0 seconds?

(1) $6.0 \times 10^3 \text{ N}$ (3) $3.0 \times 10^4 \text{ N}$

(2) $2.0 \times 10^4 \text{ N}$ (4) $6.0 \times 10^4 \text{ N}$

5.

If a 30-newton force is required to accelerate a 2-kilogram object at 10 meters per second², over a level floor, then the magnitude of the frictional force acting on the object is

(1) 0 N   (3) 20 N

(2) 10 N   (4) 30 N

"You don't have to be a fantastic hero to do certain things. You can be just an ordinary chap, sufficiently motivated to reach challenging goals."

\- Sir Edmund Hillary