Physics 160 Name _____KEY______

Lab Time ________________

Dragon ID ________________

1. If you increase the net force on an object, the object's acceleration
   a) decreases.
   b) stays the same.
   c) increases.
   d) will change but depends on the initial velocity.

$$\boxed{\vec{a} = \frac{\vec{F}}{m}}$$

2. You apply the same net force to two pumpkins. Pumpkin one is more massive then pumpkin two. Since $m_1 > m_2$ it follows that
   a) $a_1 < a_2$.
   b) $a_1 = a_2$.
   c) $a_1 > a_2$.
   d) $a_1 = a_2$ only if both pumpkins start from rest.

$$\boxed{\vec{a} = \frac{\vec{F}}{m}}$$

3. The area under the acceleration vs time graph is
   a) the change in velocity.
   b) the change in position.
   c) proportional to the force.

$$\boxed{\Delta\vec{v} = \vec{a}_{avg}\Delta t}$$

4. The area under the angular acceleration vs time graph is
   a) the change in angular velocity.
   b) the change in angular position.
   c) proportional to the angular force (torque).

$$\boxed{\Delta\vec{\omega} = \vec{\alpha}_{avg}\Delta t}$$

5. Velocity is
   a) the slope of the acceleration vs time graph.
   b) the slope of the position vs time graph.
   c) the same thing as speed.

$$\boxed{\vec{v}_{avg} = \frac{\Delta\vec{x}}{\Delta t}}$$

You drop two pumpkins from the same height. Pumpkin one is more massive then pumpkin two. Use the fact that $m_1 > m_2$ in the next two problems.

6. Compare the pumpkins gravitational acceleration.
   a) Pumpkin one has a greater gravitational acceleration.
   b) The gravitational acceleration on both pumpkins is the same.
   c) Pumpkin two has a greater gravitational acceleration.

$$\boxed{a = \frac{F_g}{m} = \frac{mg}{m} = g}$$

7. Compare the pumpkins gravitational force.
   a) Pumpkin one has a greater gravitational force.
   b) The gravitational force on both pumpkins is the same.
   c) Pumpkin two has a greater gravitational force.

$$\boxed{F_g = mg}$$

Physics 160

Name _____KEY______

Lab Time __________________

Dragon ID __________________

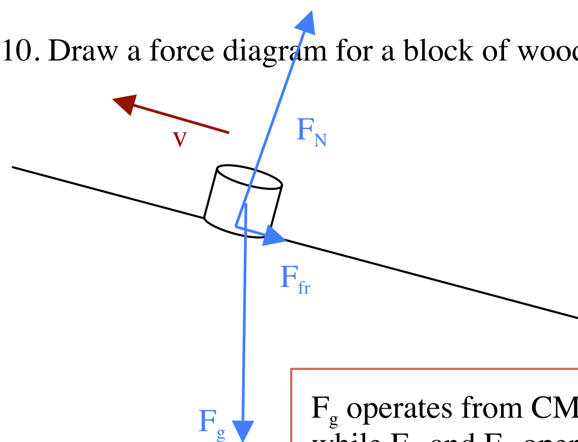
8. If the net force is zero
   a) the net torque is also zero.
   b) the object can not be moving.
   c) the object can not be spinning.
   d) all of the above.
   e) none of the above.

Since net force is zero, linear velocity is a constant which means object can still be moving. Since the net torque is not necessarily zero, angular acceleration (and angular velocity) can be anything.

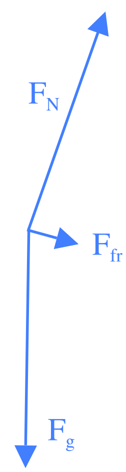
9. If the net torque is zero the object
   a) can not be spinning.
   b) can not be moving.
   c) all of the above.
   d) none of the above.

Since net torque is zero, angular velocity is a constant which means object can still be spinning. Since the net force is not necessarily zero, acceleration (and velocity) can be anything.

10. Draw a force diagram for a block of wood sliding up a ramp. Label the velocity vector.



F_g operates from CM while F_N and F_{fr} operate from the surface.



Extra Thought

The change in momentum and net force are always in the same direction.
   a) TRUE
   b) FALSE

Explain:

$$\vec{F} = \frac{\Delta \vec{p}}{\Delta t}$$