Useful Equations: \[ \Sigma F = ma \]
Force Review Sheet
\[ F = \mu F_N \]
\[ \Sigma F = F_{\text{one direction}} - F_{\text{opposite direction}} \]

1. Which has more inertia, a mouse or an elephant? Why? What relation does that relate to Newton's 1st Law?
2. What is equilibrium? What is the net force on an object at rest? What does that tell you about the amount of force to the right compared to the amount of force to the left?
3. Can an object be in motion if there is no net force on the object? Why or why not?
4. Why do you have to keep pedaling a bike to maintain a constant speed?
5. In which direction does friction act? What happens to the force of friction as \( F_N \) increases?
6. What is the normal force? Which direction does it act (the answer is not up)?
7. A 1000. kg car is traveling down the road when the driver slams on the brakes, creating a frictional force that stops the car. The coefficient of friction is 0.35.
   a. What is the amount of frictional force acting on the car?
   b. What is the acceleration of the car?
8. A 15 kg crate is pushed to the right with a force of 25 N. The crate experiences an acceleration of +0.75 m/s².
   a. What is the net force acting on the crate?
   b. What is the frictional force?
   c. What is the coefficient of friction?
9. A student pulls a 15 kg box with a force of 40.0 N at an angle of 25° above the horizontal. If the coefficient of friction, \( \mu \), is 0.08:
   a. What are the components of the force?
   b. What is the normal force?
   c. What is the force of friction (\( F_f \))?
   d. What is the acceleration of the box?
10. While walking through the airport, Mr. B pulls his luggage behind him at a constant velocity with a force of 200 N at 30.0° above the horizontal. If his luggage has a mass of 35 kg,
    a. What is the magnitude of the friction acting on the luggage?
    b. What is \( \mu \)?
11. A boy kicks a soccer ball, creating what type of force (contact or field force)?
12. What is an example of a field force? It is due to gravity.
13. What does Newton's 1st Law have to do with wearing a seatbelt?
14. What does the inertia of an object depend on?
15. Show the correct relationship for Newton's 2nd Law on the graphs below.
16. Find the net force on these objects:
   a. 8 N
   b. 10 N
   c. 15 N
   d. 18 N

- Friction Force: 4.0 N

Frictional Force: 9 N