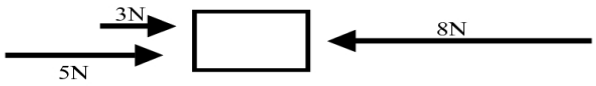
# NEWTON'S SECOND LAW MATH PRACTICE + FORCE DIAGRAMS

Directions: For problems involving math, write the formula, show your work, and box your answer. For problems requiring explanation, write in complete sentences.

**Information you need:**
Force is measured in *Newtons*.
Acceleration due to gravity is 9.8 $m/s^2$.
Force equals mass multiplied by acceleration (mass must be in kg). F = m x a
Acceleration equals force divided by mass (mass must be in kg). A = F/m

1. Three forces act on a box that is initially at rest as shown below. Determine the net force acting on the crate and describe the resulting motion of the crate.




2. Suppose two 4-newton forces act on an object in the same direction. What is the net force on the object?

3. Five different forces act on an object. Is it possible for the net force on the object to be zero? Explain.

4. What happens to an object when an unbalanced force acts on it?

5. An automobile with a mass of 1000 kilograms accelerates when the traffic light turns green. If the net force on the car is 4000 newtons, what is the car's acceleration?

6. Calculate the acceleration of a 2000-kg, single-engine airplane just before takeoff when the thrust of its engine is 500 N.

7. Calculate the acceleration of a 300,000 kg jumbo jet just before takeoff when the thrust for each of its four engines is 30,000N.