Newton's Second Law of Motion Problems Worksheet

Newton's Second Law of Motion, sometimes called the law of force and motion or law of acceleration, states that:

> An object acted on by an unbalanced force will accelerate in the direction of that force, in direct proportion to the strength of the force, and in inverse proportion to the mass of the object.

Newton's second law is best described with a mathematical equation that relates three variables, force, acceleration and mass, to one another. The equation can be stated in three forms:

force = mass • acceleration

mass = force / acceleration

Acceleration = force / mass

$$\boxed{F = m \times a}$$

1. An object with a mass of 2.0 kg accelerates 2.0 m/s2 when an unknown force is applied to it. What is the amount of the force? _____ (show your work)

2. An object with a mass of 5.0 kg accelerates 8.0 m/s2 when an unknown force is applied to it. What is the amount of the force? _____(show your work)

3. An object accelerates 2.0 m/s2 when a force of 12.0 newtons is applied to it. What is the mass of the object? _____ (show your work)

4. An object accelerates 7.2 m/s2 when a force of 4.0 newtons is applied to it. What is the mass of the object? _____(show your work)

5. An object with a mass of 2300 g has a force of 6.2 newtons applied to it. What is the resulting acceleration of the object? _____(show your work)

6. An object with a mass of 3.2 kg has a force of 7.3 newtons applied to it. What is the resulting acceleration of the object? _____(show your work)