Name Answer Key
Honors Physics
Period _____

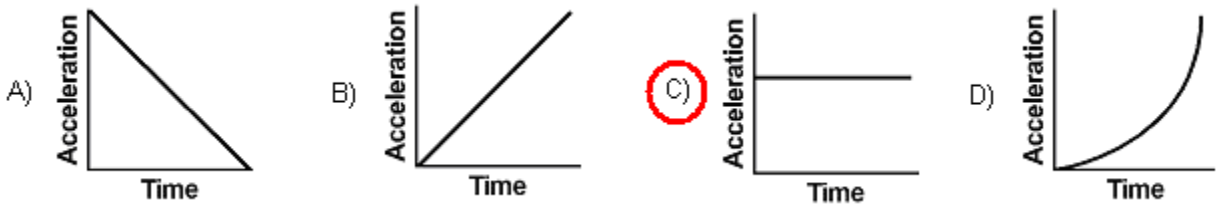
A

Date _____
Forces WS #2H
Mrs. Nadworny

# Newton's 2nd Law

**Directions** – Read textbook pages 136 – 138. Solve the following problems using the GUESS method and correct significant figures. Be sure to show ALL work!

1. A constant unbalanced force is applied to an object for a period of time. Which graph best represents the acceleration of the object as a function of elapsed time?




2. Determine the acceleration that will result when a 12 N net force is applied to the South
   a. a 3.0 kg object.

$$a = \frac{F_{net}}{m} = \frac{12\ N}{3.0\ kg} = 4.0\ m/s^2\ South$$

   b. a 6.0 kg object.

$$a = \frac{F_{net}}{m} = \frac{12\ N}{6.0\ kg} = 2.0\ m/s^2\ South$$

   c. When mass is doubled the acceleration from the same force is HALF the size.

3. Chris P. Baecon applies a net force of 19.4 N to wheel barrow causing it to accelerate at a rate of 4.82 m/s$^2$. Determine the mass of the wheel barrow.

$$m = \frac{F_{net}}{a} = \frac{19.4\ N}{4.82\ m/s^2} = 4.02\ kg$$

4. David Purley, a racecar driver, survived a deceleration from 48.1 m/s to 0 m/s over a distance of 0.660 m when his car crashed. Assuming that Purley's mass is 70.0 kg, determine the average force acting on him during the crash.

$$a = \frac{vf^2 - vi^2}{2d} = \frac{(0\ m/s)^2 - (48.1\ m/s)^2}{2\ (0.660\ m)} = -1750\ m/s^2\ (backwards)$$

$$F = ma = (70.0\ kg)(-1750\ m/s^2) = -1.23 \times 10^5\ N\ (backwards)$$

Answers in size order: 2.0, 4.0, 4.02, 1.23 x $10^5$