

Name: \_\_\_\_\_

Section: \_\_\_\_\_

### More Force Practice Problems

Directions: Use the skills you have acquired from class to solve the problems below. **Please show all work!**

1. A frisbee with a mass of 0.175 kg leaves your hand with an acceleration of  $50 \text{ m/s}^2$ . What size force did you apply?
2. You push a merry-go-round on which Tim and Katie are riding. Tim weighs 45 kg and Katie weighs 36 kg, while the merry-go-round weighs 163 kg. The merry-go-round leaves your hand with an acceleration of  $40 \text{ m/s}^2$ . What size force was applied?
3. Suppose you enter a World's Strongest Man/Woman competition and the first event is the vehicle pull. What is the vehicle's mass if you apply a force of 1000 N and the vehicle accelerates at a rate of  $0.5 \text{ m/s}^2$ ?
4. How much do your little sister (20 kg) and her big wheel (7 kg) accelerate when you push them with a force of 45 N while a frictional force of 5 N opposes her motion?
5. How many **newtons** are necessary for a 6,000 g mass to accelerate at a rate of  $2.5 \text{ m/s}^2$ .

6. A ball with a volume of  $3 \text{ cm}^3$  and a density of  $9.0 \text{ g/cm}^3$  increases its velocity from  $2 \text{ m/s}$  to  $6 \text{ m/s}$  over a 12 second period of time. What force was applied to get it moving?
7. A Bugatti Veyron went from 0 to 60 mph in 2.5 seconds. What is the mass of the vehicle if the force used to move the car was 10,000 N?
8. While traveling home at dusk, a motorcyclist gets on the highway and increases the combined mass (400 kg for the motorcycle and 150 kg for the motorcyclist) from 30 mi/hr to 70 mi/hr in 3 seconds. While struggling to clean his helmet later that evening, he wonders what would have been the acceleration of one of those bugs striking his helmet if it had a mass of 5 g. ***Hint: Considering Newton's 3<sup>rd</sup> Law will help you figure this out.***