Momentum, Acceleration & Newton's 2nd Law

Name: _____

Directions: Use the correct equation to answer the following questions. **Be sure to include all three steps.**

1. A running back has a mass of 98 kg and a velocity of 9.8 m/s. What is his momentum?

2. A car driving a speed of 80 km/h hit a tree and came to a stop in 2.1 seconds. What was the car's acceleration?

3. A lineman has a mass of 125 kg. If he wants to have the same momentum as the running back in #1, what must his velocity be?

4. A person on a horse whose combined mass was 350 kg traveled 15 km in 47 minutes. What was the momentum of the person and the horse?

5. A racecar driving a pace of 98 km/hr increased his velocity to 105 km/h in 7 seconds. What was the acceleration of the car during that period of time?

6. If a 75 kg soccer player kicks a ball with a force of 225 N, at what rate will the soccer ball accelerate down the field?

7. How much force will be needed to accelerate a car with a total mass of 1160 kg a rate of 3 m/s^2?

8. A baseball is thrown by the pitcher at a velocity of 95 km/h. The ball traveled a total time of 5.5 seconds from the pitchers hand to the batter. What was the ball's acceleration?

$P = m \cdot v$ | $a = \frac{v_f - v_i}{t}$ | $v = \frac{P}{M}$ | $v = \frac{D}{T}$ | $a = \frac{F}{M}$ | $F = ma$