Linear Motion Practice Questions

$a = v/t$ $a = v2-v1/t$ $F = ma$ $Q = Ft$ $M = mv$

Velocity and Acceleration Practice

1. A skater goes from a standstill to a speed of 6.7 m/s in 12 seconds. What is the acceleration of the skater?

2. As a sprinter comes to a normal stop, they slows from 9.00m/s to 0.00m/s in 5.00s. Find the acceleration of the sprinter.

3. During a race, a sprinter increases from 5.0 m/s to 7.5 m/s over a period of 1.25s. What is the sprinter's average acceleration during this period?

4. A wheel chair athlete starts from rest and accelerates at a constant rate of 1.500 m/s^2. What is the speed of the athlete after it they have traveled for 4.75 seconds?

Linear motion

1. How much force would be applied to a quarter back if a linebacker with a mass of 100kg is accelerating at 5m/s^2 hits them?

2. What would the acceleration of Usain Bolt be if he applies 500 N of force and has a mass of 80Kg?

3. a) Lineman J.J. Watt weighs 110 kg and can move at a velocity of 8.2 m/s.
What is his momentum?
b) What is running back Adrian Peterson's momentum if he weighs 98 kg and travels at a velocity of 9.3 m/s?
c) Upon impact, who would continue forward?

4. Aaron Judge (95 kg) is rounding the bases traveling 10m in 1.4s when he collides with shortstop Devin Travis (88 kg), who is fielding a grounder, covering 10m in 1.3s. Who will continue forward?

5. In bumper cars, Car A has a mass of 200 kg and a speed of 18 m/s. Car B has a mass of 170 kg. How fast must Car B go in order to bump Car A back?

6. During a high-stakes shuffleboard match, Randy pushes the shuffleboard rock (?) with a force of 20 N for 1.1 s, while Tony pushes with a force of 25 N for only 0.9 s. Whose shuffleboard rock will travel the farthest? (assuming the rocks have equal mass)