Newton's Laws Worksheets

Show all work on a separate sheet of paper.

1. A little boy pushes a wagon with his dog in it. The mass of the dog and wagon together is 45 kg. The wagon accelerates at 0.85 m/s^2. What force is the boy pulling with?

2. A 1650 kg car accelerates at a rate of 4.0 m/s^2. How much force is the car's engine producing?

3. A 68 kg runner exerts a force of 59 N. What is the acceleration of the runner?

4. A crate is dragged across an ice covered lake. The box accelerates at 0.08 m/s^2 and is pulled by a 47 N force. What is the mass of the box?

5. 3 women push a stalled car. Each woman pushes with a 425 N force. What is the mass of the car if the car accelerates at 0.85 m/s^2?

6. A tennis ball, 0.314 kg, is accelerated at a rate of 164 m/s2 when hit by a professional tennis player. What force does the player's tennis racket exert on the ball?

7. In an airplane crash a woman is holding an 8.18 kg, 18 pound, baby. In the crash the woman experiences a horizontal de-acceleration of 88.2 m/s^2. How many g's is this de-acceleration? How much force must the woman exert to hold the baby in place?

8. When an F-14 airplane takes-off an aircraft carrier it is literally catapulted off the flight deck. The plane's final speed at take-off is 68.2 m/s. The F-14 starts from rest. The plane accelerates in 2 seconds and has a mass of 29,545 kg. What is the total force that gets the F-14 in the air?

9. A sports car accelerates from 0 to 60 mph, 27 m/s, in 6.3 seconds. The car exerts a force of 4106 N. What is the mass of the car?

10. A sled is pushed along an ice covered lake. It has some initial velocity before coming to a rest in 15 m. It took 23 seconds before the sled and rider come to a rest. If the rider and sled have a combined mass of 52.5 kg, what is the magnitude and direction of the stopping force? What do "we" call the stopping force?

11. A car is pulled with a force of 10,000 N. The car's mass is 1267 kg. But, the car covers 394.6 m in 15 seconds.