Force Problems I

1. A car of mass 1000 kg is accelerating with a constant rate of 1.5 m/s^2. What is the net force acting on the car?

2. An airplane is accelerating down the runway. The mass of the airplane is 15,000 kg. If the engines are producing a net force of 45,000 N, what is the acceleration of the airplane?

3. There is a net force of 200 N acting on a girl on a skateboard. If her acceleration is 4 m/s^2, what is her mass?

4. Tony is pulling Manny, who is sitting in a toy wagon. Tony is pulling with a force of 250 N. Manny and the wagon have a combined mass of 75 kg. If there is also a frictional force of magnitude 100 N acting on Manny and the wagon, what is Manny's acceleration?

5. Sasha is pushing Kara with a force 350 N. Kara has a mass of 50 kg. If Kara is accelerating with a rate of 2 m/s^2, what is the magnitude of the force of friction acting on Kara?

6. A car of mass 1500 kg is accelerating with a rate of 3 m/s^2. If the magnitude of the retarding forces on the car is 6000 N, how much force must the engine be producing?

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7. You are in your car, mass 1500 kg, traveling down the highway with a speed of 25 m/s. You see traffic ahead and apply the brakes. You slow down to 15 m/s in 4 seconds. What was the net force on the car?

8. A happy physics student wants to determine how much force she can produce. Starting from rest, she accelerates and covers 5 meters in only 1.5 seconds. If she has a mass of 55 kg, what was the net force on her?

9. A skateboarder, mass 75 kg, coasts from 15 m/s to 10 m/s over a distance of 25 meters. What was the magnitude of the force of friction acting on the skateboarder?

Answers

1) 1500 N *2) 3 m/s²* *3) 50 kg*
4) 2 m/s² *5) 250 N* *6) 10,500 N*
7) –3750 N *8) 244 N* *9) 188 N*