Physics 11 Worksheet - Newton's Laws – Extra Problems

A 250kg anvil is sitting on a table. What is the normal force on the anvil?

2. An unbalanced force of 2.5×10^3 N is applied to an object with a *weight* of 3.0×10^3 N on a frictionless surface. What is the object's acceleration?

3. A physics student pushes on a stationary soccer goalpost and measures a maximum force of 120N before the goal starts to move. If the coefficient of static friction is 0.25, what is the mass of the goalpost?

4. A car is driving at constant speed down the road. The mass of the car is 1200kg and the coefficient of rolling friction is 0.15? How much engine force is needed to keep the car moving?

5. A Jaguar XKE is listed in the Guinness Book of World records as having the world's longest skid mark at 289m (was driving along a highway and had to slam on the brakes to stop). The coefficient of friction between rubber and asphalt is approximately 0.70. How fast was the Jag going when it started to skid?

6. A 2.5 kg basketball is dropped from the top of a building. Its acceleration is found to be 9.4 m/s^2 as it drops to the ground. What is the force of air friction on the ball as it falls?

7. A physics student pulls on a 50kg cement block at a speed of 2.2 m/s with a force of 250N. The block hits a rough patch and stops in 0.50 seconds. What was the coefficient of friction in the rough patch?

8. A 2500kg towplane pulls a 600kg glider along a grass runway. They reach takeoff speed of 31 m/s in 9.0 seconds. The coefficient of friction between the wheels and the runway is 0.22. How much engine force does the towplane produce?

9. State which of Newton's Three Laws best applies to the following situations:

   a) A rock falls off a cliff, and accelerates towards the ground. _____

   b) Two physics students give each other a high five. Their hands hurt! _____

   c) A car is stuck in the snow, spinning its wheels trying to move forward _____