**1) Draw a free body diagram to show the forces involved in the situations below.**

1. A holiday decoration is hanging from the ceiling by a light (massless) string.
2. A child is pulling his younger brother in a sled on snow (friction is involved).
3. In order to move a piano, movers have set up a ramp. They are pulling the piano up the ramp, which is not frictionless. Draw the forces acting on the piano.
4. The engine of a rocket is pushing the rocket towards the sky.
5. A girl is pushing a box on a frictionless surface.
6. A box is sitting on a rough (friction) inclined plane.

**2) What is the net force in the situations below? (Start with a FBD.)**

1. A boy pushes a 10.0 kg box with a force of 50 N. The friction force is equal to 10 N. What is the net force acting on the box?
2. A engine pushes an 800 kg rocket up with a force of 10 000 N. What is the net force acting on the rocket?
3. A 1.0 kg rock is dropped from the top of a building. What is the net force if

i. there is no air resistance

ii. there is air resistance (5.0 N)

1. A boy is trying to push a 10 kg box on a rough floor. He pushes with 19.6 N. The force of friction has a magnitude equal to 20% of the weight of the box. The normal force has a magnitude of 98 N. What is the net force on the box?