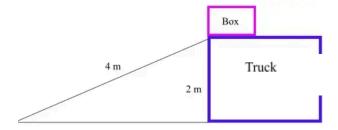1. Harry Pitts pulls a 15 kg wagon (negligible friction) with his 25 kg kid in it. 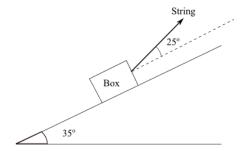The handle of the wagon that Harry is pulling is at an angle of 25° from the ground. The wagon accelerates at 1.4 m/s².
    a. Draw a free-body diagram of the "wagon with the kid" system.
    b. What is the force that Harry exerts on the handle of the wagon?

2. Kat Phight pulls on a rope attached to a crate to move the crate across a horizontal floor. The mass of the crate is 20.6 kilograms and Kat applies 115 newtons of force at an angle of 26.7 degrees from the horizontal. The crate experiences a force of friction of 25 N.
    a. Draw a free-body diagram of the crate.
    b. How hard does the floor push up on the crate?
    c. What is the acceleration of the crate?

3. A 2 kg box is put on the surface of an inclined plane at 27° with the horizontal. The surface of the inclined plane is assumed to be frictionless.
    a) Draw a free body diagram of the box on the inclined plane and label all forces acting on the box.
    b) Determine the acceleration of the box down the plane.
    c) Determine the magnitude of the force exerted by the inclined plane on the box.

4. A particle of mass 5 kg rests on a 30° inclined plane with the horizontal. A force of magnitude 30 N acts on the particle in the direction parallel and up the inclined plane. There is friction opposing the applied force.
    a) Draw a Free Body Diagram including the particle, the inclined plane and all forces acting on the particle with their labels.
    b) Find the force of friction acting on the particle.
    c) Find the normal force exerted by the inclined on the particle.

5. A 100 kg box is slightly pushed so that it slides down an inclined plane 4 meters long from the bed of a truck that is 2 meters above the ground. The box accelerates at 2.9 m/s². What is the force of friction acting on the box?

6. A 10 kg box rests on an inclined plane that is 35° with respect to the horizontal. A string is used to keep the box in equilibrium (no motion). The string makes an angle of 25° with the inclined plane. The force of friction acting on the box is 79.3 N.

    a) Draw a Free Body Diagram including all forces acting on the box with their labels.
    b) Find the magnitude of the tension, T, in the string.