

Be sure to include the appropriate UNITS, **draw Free Body diagrams** where appropriate, use **Fnet statements**, show your thinking and use Complete Sentences.

1. A 60 kg person is standing on a bathroom scale inside an elevator. The scale is calibrated in Newtons and measures the normal force. (6 marks)
 - (a) What is the reading on the scale when the elevator is not moving?

 - (b) What is the reading on the scale when the elevator is rising at a constant velocity of 5 m/s?

 - (b) What is the reading on the scale if the elevator is accelerating downward at 1.8 m/s^2 ?

2. A 50kg block slides across a surface while experiencing a 300 N force. The block moves with a constant speed. What is the coefficient of kinetic friction between the block and the new surface? (4 marks)

3. Two sleds are tied together with a rope. The coefficient of static friction between each sled and the snow is 0.3. A small child is sitting on the lead sled #1 (total mass of 20 kg) and a larger child sits on the back sled #2 (total mass of 40 kg). An adult pulls on a rope attached to sled #1.(8 marks)
- a) What is the greatest horizontal force that the adult can exert on sled 1 without moving either sled?
- b) Calculate the magnitude of the tension in the rope between sleds 1 and 2 when the adult exerts this greatest horizontal force.
4. A block is pushed across a horizontal surface with a coefficient of kinetic friction of 0.2 by applying a 150 N horizontal force. The block accelerates at the rate of 2.6 m/s^2 . Find the mass of the block. (4 marks)