Frictional Forces Worksheet   /25

Name: _____   Date: _____

Analyze the following situations, solving for the missing information. You must show all work including FBDs and units to receive full marks. You will have to complete the diagrams as necessary, adding in the appropriate forces and labeling them correctly.

1. [5 marks] A box of mass 30 kg is pushed horizontally across the floor with a force to the left of 210 N and to the right with a force of 50 N. a) Determine the weight of the box, b) the size of the normal force, c) the size of the frictional force and d) the resulting acceleration of the box.   The coefficient of friction is 0.2.

2. [5 marks] A book (m =1.1 kg) is being pushed across a table. A force of 30 N is pushing down on the book, while a force of 240 N is pushing to the right. Calculate the acceleration of the book if the coefficient of friction is 0.45.
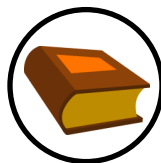
3. [5 marks] Two children are pushing a 80 kg sled across the ice. One is pushing with a force of 120 N [left] while the other is pushing with a force of 22.5 N [right]. The coefficient of friction is 0.05. Calculate the resulting acceleration of the sled.

4. [5 marks] A 45-kg cart has an acceleration of 3.5 m/s^2 [right] when a force of 250 N [right] and 25 N [left] is applied to it. Calculate the coefficient of friction, μ .

5. [5 marks] Calculate the **force** is required to accelerate a 1200kg car from 5 m/s to 17 m/s in 6.4 seconds under the following conditions…

   a) (neglect friction)

   b) (if the coefficient of friction is 0.45)

   c) Comment on the difference in your two answers from a) and b).