

Surfaces	Coefficient of Static Friction μ_s	Coefficient of Kinetic Friction μ_k
Wood on wood	0.4	0.2
Wood (waxed) on snow	0.14	0.1
Ice on ice	0.1	0.03
Metal on metal (lubricated)	0.15	0.07
Metal on metal (unlubricated)	0.6	0.3
Rubber on solids	1-4	1
Lubricated ball bearings	0.015	0.01
Synovial joints (in humans)	0.01	0.01

Problems: Show your work!! DRAW FREE BODY DIAGRAMS !!!!!!!!!!!!!!!

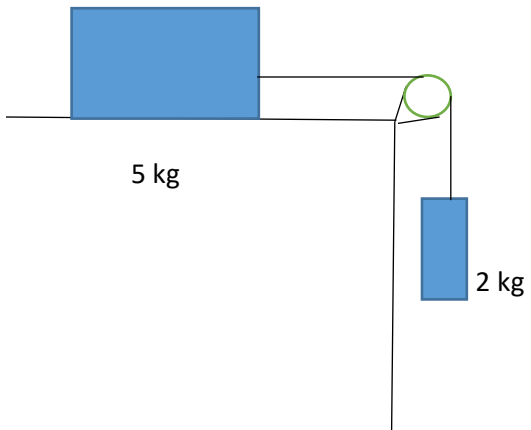
1. A 20 kg package is dragged along the floor with a force of 70N, the angle of the applied force is 25° , calculate the following:

a. The acceleration of the package. [3.17 m/s^2](3pts)

b. The magnitude of the upward force (F_N) exerted by the floor on the package [166.4 N](3pts)

c. Recalculate the acceleration of the package assuming a coefficient of kinetic friction equal to 0.3 [0.68 m/s^2](3pts)

2. In the below diagram two objects are connected by a rope running over a pulley. The coefficient of kinetic friction between object "A" and the table is 0.6 (we will ignore the mass of the rope and pulley and any friction in the pulley). Find the acceleration of the system assuming the rope won't stretch. [0 m/s^2](3pts)



3. A force of 270N is require to start a 40 kg box moving across a concrete floor. What is the coefficient of static friction between the box and the floor? [0.69](3pts)
4. What is the maximum acceleration a car can undergo on level ground if the static coefficient of friction between the tires and the ground is 0.55? [5.39 m/s^2] (3pts)
5. A box is give a push so that it slides across the floor. How far will it go, given that the coefficient of kinetic friction is 0.30 and the push imparts an initial speed of 3.0 m/s. [1.53 m] (3pts)