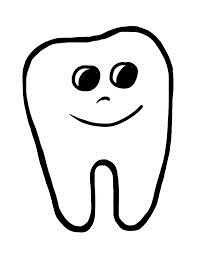
Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_

**Forces Practice Problems**

1. A 5 kg wagon is being pushed with a 30 N force on a rough floor. The coefficient of friction between the floor and the wagon is µ = 0.45. Calculate the wagon’s acceleration.
2. The same wagon is now being pulled by a 45 N force at an angle 30° above the horizontal. If the wagon is on the same rough surface, calculate the wagon’s new acceleration.
3. A 15 kg mass is hung from a spring of spring constant, K = 800 N/m, calculate how far the spring stretches.
4. A 2.3 kg projectile is placed on a spring compressing the spring, 8 cm. Calculate the spring constant, K.
5. Kyle, m = 62 kg, is sledding down a 30° hill, the coefficient of friction between the sled and the hill is, µ = 0.27. Calculate his acceleration.
6. Rhianna is pushing Ashley, m = 50 kg, up a 45° hill. The coefficient of friction between the hill and Ashley is µ = 0.82. Calculate the force required to move up the hill at a constant speed.
7. Emily hangs the sign below in front of her dentistry office, m = 22 kg. If the angle θ1 = 80° and θ2 = 30° Calculate the tension in both strings.

θ2

T2

T1

θ1

1. Two masses are attached to a massless and frictionless horizontal pulley system on a rough surface as shown, where m1 = 12 kg m2 = 8 kg and µ = 0.18, calculate the acceleration of the system.

m1

m2

1. A 15 kg wagon is being pushed with a 45 N force on a rough floor. The coefficient of friction between the floor and the wagon is µ = 0.33. Calculate the wagon’s acceleration.
2. The same wagon is now being pulled by a 30 N force at an angle 45° above the horizontal. If the wagon is on the same rough surface, calculate the wagon’s new acceleration.
3. A 15 g mass is hung from a spring of spring constant, K = 80 N/m, calculate how far the spring stretches.
4. A 11.5 g projectile is placed on a spring compressing the spring, 8 cm. Calculate the spring constant, K.
5. Julien, m = 58 kg, is sledding down a 65° hill, the coefficient of friction between the sled and the hill is, µ = 0.15. Calculate his acceleration.
6. Peyton is pushing Patrick, m = 75 kg, up a 25° hill with a 913 N force. The coefficient of friction between the hill and Patrick is µ = 0.78. Calculate Patrick’s acceleration.
7. Jessica has to hang the sign below in front of her store. If rope 1 breaks at a tension of 450 N what is the maximum mass the sign can have if θ1 = 75° and θ2 = 45°

θ2

T2

T1

θ1

1. Two masses are attached to a massless and frictionless horizontal pulley system on a rough surface as shown, where m1 = 12 kg m2 = 8 kg what is the minimum coefficient of friction needed for the system to not move?

m1

m2