

Name: _____ Date: _____

3. The *Rafflesia arnoldii* found in Malaysia, is the largest flower in the world, one meter across and with a mass of 11 kg. If the coefficient of static friction between the flower and the forest floor is 0.76, find the minimum force you would need to apply to set the flower in motion. If you continue to push the flower with the same force calculated above, and if the coefficient of kinetic friction between the flower and the forest is 0.44, calculate the acceleration of the flower. How far does the flower move in 3.75 seconds?
4. A 20kg boy on a 5 kg skateboard coasts to a rest from a speed of 4.5m/s while traveling a distance of 20m on the sidewalk. Draw a free body diagram for this situation and calculate the acceleration of the skateboard, the force of friction on the skate board and the coefficient of friction between the skateboard and the sidewalk.
5. Johnny lets a 0.5kg ball roll on the floor of the classroom. The ball gradually slows down. The coefficient of friction between the floor and the ball is 0.18. Draw a free body diagram and calculate the acceleration of the ball.

Name: _____ Date: _____

6. A traveler at Newark airport pulls his 294N suitcase with constant velocity to the check-in counter applying a force of 159N at an angle of 37° with the horizontal. Calculate the Normal force, frictional force and the coefficient of friction between the suitcase and the airport floor.

7. A mother pushes her 9.5 kg baby in her 5kg baby carriage over the grass with a force of 110N @ an angle of 30° with the horizontal. If the coefficient of friction between the wheels of the carriage and the grass is 0.14, calculate the weight, normal force, frictional force and the acceleration of the carriage.

Name: _____ Date: _____

8. The steepest street in the world is Baldwin Street in Dunedin, NZ. It is inclined at an angle of 38° , with the horizontal. A child slides down the street with a constant velocity on a sled with high friction runners. What is the coefficient of friction between the sled runners and the street?

9. A light drivable car with a mass of 9.5kg was built in London. The wheels of this car are locked, so that they no longer roll. If the car is now pushed up a 30° slope by an applied force of 80.0N , with an acceleration of 1.64 m/s^2 , what is the coefficient of kinetic friction between the car and the incline?

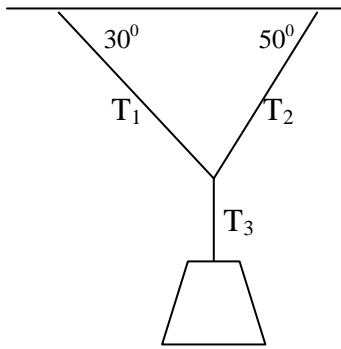
Name: _____ Date: _____

10. The record speed for grass skiing was set in 1985 by Klaus Spinka as he skied down a 34° incline. If the coefficient of kinetic friction between the skis and the grass was 0.198, what was Spinka's acceleration? If he started from rest, how fast was he moving after 6.6s?

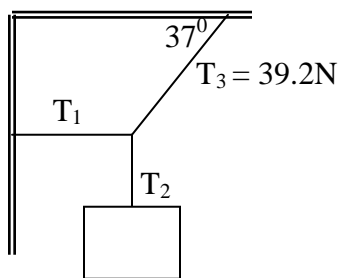
11. Suppose that the most massive car ever built is moving down a 10.0° slope when the driver applies the brakes. The net force acting on the car as it stops is -2.00×10^4 N. If the coefficient of kinetic friction between the car's tires and pavement is 0.797, find the car's mass. What is the normal force that the pavement exerts on the car?

Name: _____ Date: _____

12. A 200N lamp is suspended from three cables as shown in the figure below. Find the tensions in each of the three cables.



13. A piñata hangs from three cables as illustrated below. Find the tensions T_1 and T_2 and the mass of the piñata.



Name: _____ Date: _____

14. An 80 kg man is standing in an elevator that moves upwards with a constant velocity.

a. Draw a free body diagram for the man, and find the magnitudes of the forces acting on him.

b. If the elevator now slows down as it reaches its destination, with an acceleration of -0.5 m/s^2 , calculate the new values of the forces acting on the man.

15. A rocket is fired upwards with an acceleration of 32 m/s^2 . If the 200kg rocket experiences an air resistance force of 12000N, what is the thrust provided by the rocket engines?