

Name: _____

Date: _____

MCHS Honors Physics 2014-2015

Friction 3

1. At Sea World, a 900 kg polar bear slides down from rest along a wet slide inclined at an angle of 25 degrees to the horizontal. The coefficient of friction between the bear and the slide is 0.05.
 - a. Draw a force diagram on the picture showing the forces present on the polar bear.
 - b. What is the normal force between the slide and the bear?
 - c. What frictional force impedes the bear's motion down the slide?
 - d. What is the bear's net force down the slide?
 - e. What is the bear's acceleration down the slide?
 - f. If the slide is 2 meters long, and the above acceleration stays constant, how fast (v_f) will the polar bear be moving at the bottom of the slide?

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2. Rather than taking the stairs, Ryan likes to slide down the banister in his house. Ryan has a mass of 20 kg, the banister has an angle of 30 degrees relative to the horizontal, and the coefficient of kinetic friction between Ryan and the banister is 0.2. Ryan begins his motion from rest.
 - a. What is the normal force between the banister and Ryan?
 - b. What is the force of friction impeding his motion?
 - c. What is the net force on Ryan?
 - d. How large is the acceleration as Ryan slides down?
 - e. If I time Ryan and it takes 1.5 seconds for Ryan to slide down the banister, what will be Ryan's ending velocity (v_f) at the end of the banister?