PS#8 Due in Class Monday, March 2 Please pay good attention to describe the lens you are using and explain your method.

**** Make sure to consider the direction of acceleration to inform your choice of axis. Do you remember how to pick a good axis?

1. 7.0 Exercise 1

2. 7.0 Exercise 2, pushing my daughter on a sled

3. 7.0 Exercise 3. Throwing a rock off a cliff

4. You are watching the fuzzy dice from the rearview mirror. As you take off on level ground, it makes an angle as shown at right.
   a) **** state how you will inform your choice of axis.
   b) Estimate the acceleration of the car.
   c) What must be the coefficient of friction of your tires for this to happen?
   d) Is this realistic?
   e) If the mass of the dice is 100 g, what is the tension in the string?
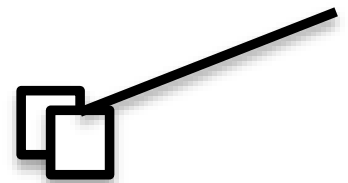
5. 7.1 Exercise 1 Pushing sled using energy
6. 7.1 Exercise 2 finding torque
7. 7.1 Exercise 3 Finding tension on string
8. 7.1 Exercise 4 Collision on ice
9. Your 50 kg friend is considering a new ride at the amusement park, kind of like a Ferris wheel that takes you in a circular path high in the sky except in _this_ ride, you are tied at your waist onto a rotating bar and are inverted at the bottom as shown. The bar can either pull or push on your body. The ride is 10 m across and maintains a constant speed of 10 m/s where the people are.
   i. At which position (top or bottom) would the force the bar puts on your friend's body be the greatest or is this force always the same? Please fully explain your reasoning.
   ii. Find the force the bar puts on your friend in the position it pushes/pulls the hardest.
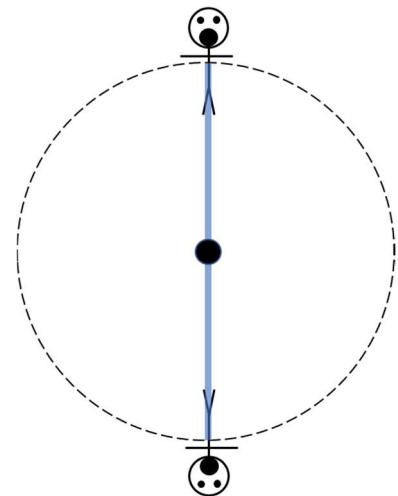
10. Two identical masses, A and B, hang from strings wrapped around the outer edge and inner pulley of a freely rotating flywheel as show. The pulley is connected to the flywheel and they rotate as a single body. The flywheel/pulley is released from rest. Which string A or B has a greater tension, or are they the same tension? Please fully explain your answer.