Name:_____Date:_____Course:_____Professor: _____

M20b Prelab: Centripetal Force and Uniform Circular Motion

Read the lab instructions and watch the videos before answering the questions

1) Provide the equation that relates the centripetal force to angular velocity, mass and radius of rotation.

2) Which force is playing a role of the centripetal force in the experiment? (weight, tension, normal force, etc.)

3) Draw a free body diagram of the hanging mass, apply Newton's second Law and find the equation for tension on the string.

4) An object with mass m = 6.349 kg is attached to a string of length r = 5.17 m and is rotating with an angular velocity ω = 8 rad/s.

a) Calculate the centripetal force acting on the object?

b) If you double the length of the string but maintain the same angular velocity, how does that affect the centripetal force?

c) Calculate the tangential velocity of the mass attached to the string.