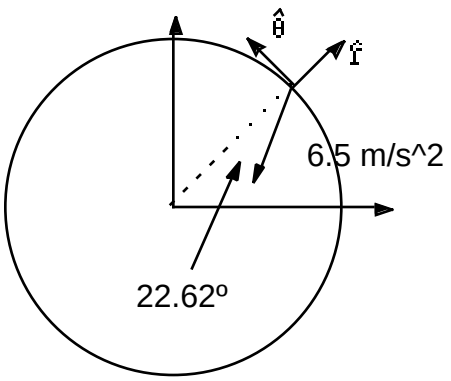
1. a. - c.) State Newton's Laws clearly and completely in prose form.
   d. Define: average velocity

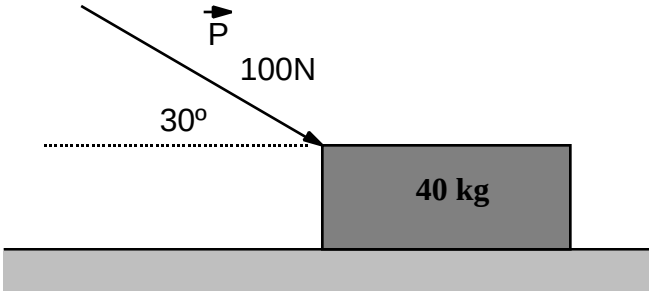
2.) A cyclist traveling on a banked circular track of radius 24 m has an acceleration of 6.5 m/s^2 directed at 22.62° behind the centripetal line (shown as a dotted line). a.) Find the speed of the cyclist, b.) Given that the cyclist is slowing down, is the cyclist traveling CW or CCW around the path ? c.) At what rate is the cyclist clowing ?



3. A surgical tubing water cannon launches a water balloon at 49 m/s and 53.13° above the horizontal from ground level in a test firing.
   a.) Give equations for the horizontal and vertical positions of the balloon as a function of the time t elapsed after firing.
   b.) Give the equations for the horizontal and vertical components of velocity of the balloon as a function of the elapsed time t.
   c.) Find the time required for the balloon to reach the highest point in its trajectory.
   d.) What is the maximum height attained by the projectile ?

4. A box is being pushed across a smooth floor by a 100 N force applied at 30° below the horizontal. a.) Make a beautiful, clear free-body diagram for the box. b.) Find the magnitude of the normal force exerted on the box by the floor. c.) Find the acceleration of the box.

   m_{box} = 40.0 kg
   g = 9.800000 m/s^2



5. **On the back**: a.) Sketch the v vs t plot corresponding to the given x vs t plot.
   b.) Use the 'five-point' method to graphicaly determine the direction of the acceleration for the motion represented by the motion diagram. SHOW SOME WORK IF YOU WANT SOME POINTS.