Name________________________ **Student Id:**________________________

Math 120, Section A **Quiz 5** **30 October 1997**

Instructions: You have 30 minutes for this quiz. Show all of your work.

1. (6) If a circular arc of length 5 km subtends a central angle 20°, find the radius of the circle.

2. Suppose you are measuring distances along the earth's equator. Let **C** be a point at the earth's center, and let **A** and **B** be distinct points on the equator. If the diameter of the earth is approximately 8,000 miles, what is the shortest distance between points **A** and **B** if angle **ACB** has measure:

   (a) (3) 60°

   (b) (3) $\frac{36\pi}{3}$ Rad

3. (6) You measure a diameter of 24 inches for a tire on your car. If you are driving down the highway at 70 MPH, what is the angular speed of the tire in revolutions per minute?

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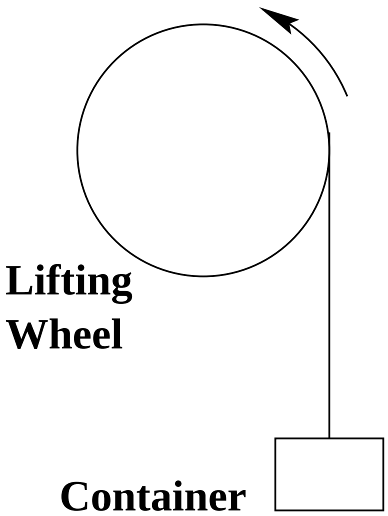
4. A large wheel of diameter 2 feet is used to lift containers as shown below.



(a) (3) What is the distance the container is raised if the wheel rotates through an angle of $\frac{9\pi}{4}$ radians?

(b) (3) What is the angle in radians through which the wheel must rotate in order to lift a container 30 feet?

5. An old LP record has a 12 inch diameter, and it rotates with an angular speed of $33\frac{1}{3}$ RPM.

   (a) (3) What is the angular speed of the record in radians per minute?

   (b) (3) What is the linear speed of a point on the **outer edge** of the record?