MTH 30 LECTURE NOTES (Ojakian)

Topic 19: Angles and Radians

OUTLINE
(References: 5.1)

1. Angles
2. Radian Measure
3. Arclength Formula

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1. Angles
   (a) What is an angle?
   (b) Recall **degrees**.
2. Radian measure
   (a) Angles can be measured in degrees or radians. Just different units (like Kilograms versus Grams)
      i. Remember: 180 degress $= \pi$ radians
      ii. Degree to Radian: Mult by $\pi/180$
      iii. Radian to Degree: Mult by $180/\pi$
   (b)

   PROBLEM 1.
      i. Convert 90° *to radians.*
      ii. Convert $\pi/3$ *radians to degrees.*
   (c) Why radian measure preferred? ...
3. Arc length Formula
   (a) Terminology:
      i. A central angle in a circle
      ii. A central angle and its corresponding **arc**
      iii. Arclength formula: $s = r\theta$
      (**Must have** θ **measured in radians!)**
      Think: $s = (2\pi r)\left(\dfrac{\theta}{2\pi}\right) = r\theta$
   (b) Typical Use: Given 2 of the quantities, find the third quantity.

   PROBLEM 2. *Suppose a circle with radius 5 has a central angle of* $\pi/4$*. How long is the arc of the circle that corresponds to this central angle?*

   PROBLEM 3. *Suppose a circle has a central angle of* 90 *degrees which subtends an arc of length* 10*. Find the radius of the circle.*