

Overview - Trig: The mini-unit

- Radians and arc length
- The trigonometric functions defined

Notes

Radians

Definition (Radian measure)

The radian measure of an angle, centered at the unit circle, is equal to the length of the arc that the angle cuts from the circle.

Method (Converting between degrees and radians)

To convert degrees to radians, multiply by $\frac{\pi}{180}$

To convert radians to degrees, multiply by $\frac{180}{\pi}$

Notes

Arc Length

Definition (Arc Length, Radius, and Angle)

The arc length can be calculated as the product of the radius and angle *in radians*.

This is written as $s = r\theta$

Example (Find the length of the arc that is cut when a 20° angle is cut from a circle with radius 6in.)

- The angle is $20^\circ \frac{\pi}{180} = \frac{\pi}{9}$
- The arc length is $6\left(\frac{\pi}{9}\right) = \frac{2\pi}{3}$ inches

Notes

The Trigonometric Functions

Notes

Definition

When an angle θ is placed in standard position at the center of a circle with radius r , so that it cuts the circle at (x, y) then the six trigonometric functions are defined as follows:

- $\sin \theta = \frac{y}{r}$
- $\cos \theta = \frac{x}{r}$
- $\tan \theta = \frac{y}{x}$
- $\csc \theta = \frac{r}{y}$
- $\sec \theta = \frac{r}{x}$
- $\cot \theta = \frac{x}{y}$

Solving Equations Graphically

Notes

Example (Solve $\tan x = 0.2, \pi/2 \leq x \leq \pi/2$ graphically)

- Set mode of calculator to radians
- Set $Y = \tan x - 0.2$
- Use the zero function.
- Answer is 0.197

Homework

Notes

Section 1.6 Quick Review (page 52): (7 problems)

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