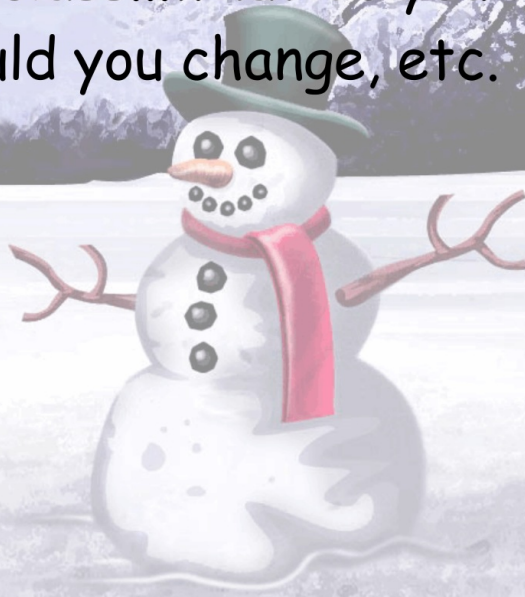


Friday, September 6

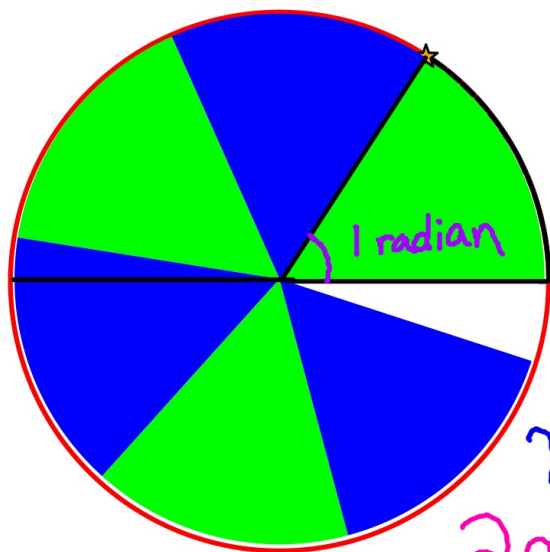
Evaluate the class...what do you like,
what would you change, etc.



September 5 - Day 2

Students will verbally explain how to
convert between radians and degrees
(using the words:
radian, degree, angle, proportion...)

What is a radian?



Radian:

The measure of the central angle that intercepts an arc equal in length to the radius of the circle

$$\pi \text{ radians} = 180^\circ$$

$$2\pi \text{ radians} = 360^\circ$$

Converting between
radians and degrees

use the conversion factor
 $\pi \text{ radians} = 180^\circ$

use a proportion

$$\frac{\pi \text{ radians}}{180^\circ} = \frac{? \text{ radians}}{x^\circ}$$

$$\frac{? \text{ radians}}{\pi \text{ radians}} = \frac{x^\circ}{180^\circ}$$

Convert
 120° to
radians

$$\frac{\pi \text{ radians}}{180^\circ} = \frac{y}{120^\circ}$$

$$\frac{\pi(120)}{180} = \frac{y(180)}{180}$$

$$\frac{120\pi \div 60}{180 \div 60} = y$$

$$\frac{2\pi}{3} = y$$

Converting between radians and degrees

Convert 150° to radians

use the conversion factor
 π radians = 180°
 with a proportion

$$\frac{\pi \text{ radians}}{180^\circ} = \frac{x \text{ radians}}{y^\circ}$$

$$\frac{\pi \text{ radians}}{180^\circ} = \frac{x \text{ radians}}{150^\circ}$$

$$150(\pi) = 180(x)$$

$$\frac{150\pi}{180} = \frac{180x}{180}$$

$$\frac{150\pi}{180 \div 30} = x$$

$$\frac{5\pi}{6} = x$$

How cross multiplication works:

$$150 \cdot \frac{\pi}{180} = \frac{x}{150} \cdot 150$$

$$180 \cdot \frac{150\pi}{180} = x \cdot 180$$

Converting between radians and degrees

Convert 135° to radians

use the conversion factor
 2π radians = 360°
 or
 π radians = 180°
 with a proportion

$$\frac{2\pi \text{ radians}}{360^\circ} = \frac{x \text{ radians}}{y^\circ}$$

$$\frac{\pi \text{ radians}}{180^\circ} = \frac{x \text{ radians}}{y^\circ}$$

$$\frac{\pi \text{ radians}}{180^\circ} = \frac{x \text{ radians}}{135^\circ}$$

$$135(\pi) = x(180)$$

$$\frac{135\pi}{180} = \frac{x(180)}{180}$$

$$\frac{135\pi \div 45}{180 \div 45} = x$$

$$\frac{27\pi \div 9}{36 \div 9} = \frac{3\pi}{4} = x$$

$$180 \cdot \frac{\pi}{180} = \frac{x}{135} \cdot 180$$

$$135 \cdot \pi = \frac{x \cdot 180}{135} \cdot 135$$

Convert
 $\frac{3\pi}{5}$ radians
to degrees

$$\frac{\pi \text{ radians}}{180^\circ} = \frac{\frac{3\pi}{5} \text{ radians}}{y^\circ}$$

$$\pi(y) = \frac{3\pi}{5}(180)$$

$$\pi y = \left(\frac{3}{5}\right)\left(\frac{180}{1}\right)\pi$$

$$\pi y = \frac{540}{5}\pi$$

$$\frac{\pi y}{\pi} = \frac{108\pi}{\pi}$$

$$y = 108^\circ$$

Convert
 $\frac{2\pi}{5}$ radians
to degrees

$$\frac{\pi \text{ radians}}{180^\circ} = \frac{\frac{2\pi}{5} \text{ radians}}{x^\circ}$$

$$\pi(x) = \frac{2\pi}{5}(180)$$

$$\pi x = \frac{2}{5}\left(\frac{180}{1}\right)\pi$$

$$\pi x = \frac{360}{5}\pi$$

$$\frac{\pi x}{\pi} = \frac{72\pi}{\pi}$$

$$x = 72^\circ$$

Convert
 $\frac{4\pi}{5}$ radians
to degrees

$$\frac{\frac{4\pi}{5} \text{ radians}}{y^\circ} = \frac{\pi \text{ radians}}{180^\circ}$$

$$\frac{4\pi}{5}(180) = \pi(y)$$

$$\frac{4}{5}(\frac{180}{1})\pi = \pi(y)$$

$$\frac{720}{5}\pi = \pi(y)$$

$$\frac{144\pi}{\pi} = \frac{\pi(y)}{\pi}$$

$$144^\circ = y$$