

Precalculus!

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Announcements

- 1 Welcome to Precalculus!
- 2 My office hours this semester: M - F, 10am - 11am in Howe 113
- 3 Let's do some introductions!

Let's go explore in Canvas for a few minutes before we dive into some material.

What is an angle?

Drawing an angle

Definition (Terminology)

- Ray
- Angle
- Vertex
- Initial side
- Terminal Side

The Measure of an Angle

Definition (Terminology)

- Measure of an angle
- Degree

Standard Position

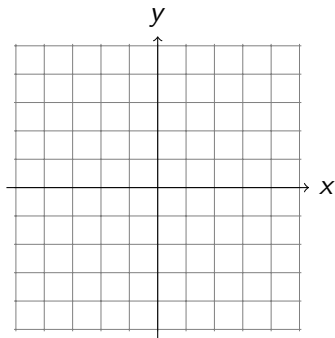
Definition (Standard Position for an Angle)

An angle is in “Standard Position” if the initial side lines up with the positive _____, and the vertex is at the _____ in the xy plane.

Example

Sketch the following angles in standard position:

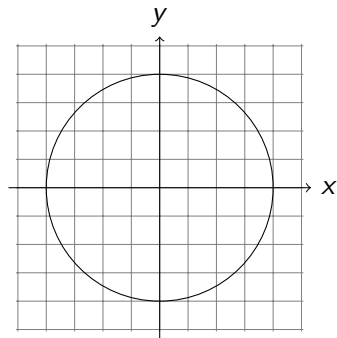
- 1 45°
- 2 120°
- 3 -135°



Radians!

Degrees are what you're most familiar with to measure an angle, but the choice of having 360° in a full circular rotation is _____.

A more natural way to measure an angle is to use _____.



Converting Between Radians and Degrees

Theorem (Conversion between Radians and Degrees)

Example

Convert:

- 1 25° to radians
- 2 $\frac{\pi}{3}$ radians to degrees.

Arc Length and Radius

As we saw above, an angle of θ radians corresponds to a fractional turn of $\theta = \frac{s}{r}$ around a circle.

We can rearrange this then to say that $s =$ _____.

Theorem (Arc length and radius)

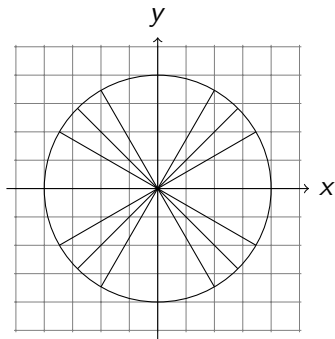
If θ is an angle measured in radians, then the arc length s along a circle of radius r corresponding to an angle of θ is

$$s =$$

Using Radians

The circumference of the earth at the equator is 24,901 miles. Using this, what is the radius of the earth?

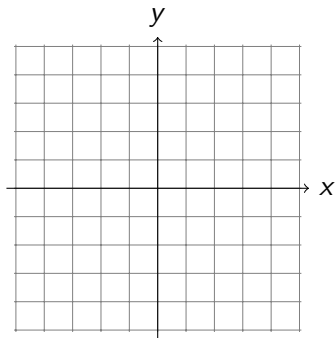
Special Angles in Radians



Coterminal Angles

Definition (Coterminal Angles)

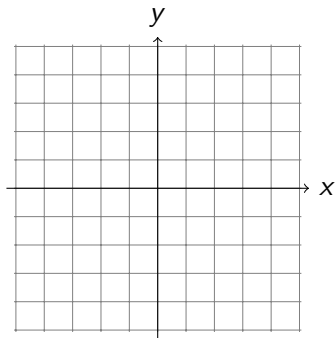
- Coterminal angles



Reference Angles

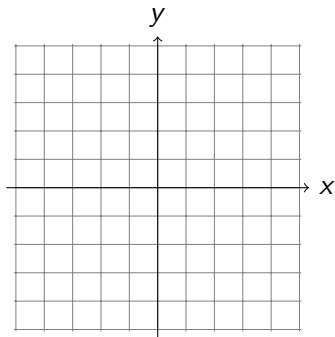
Definition (Reference Angle)

- Reference Angle

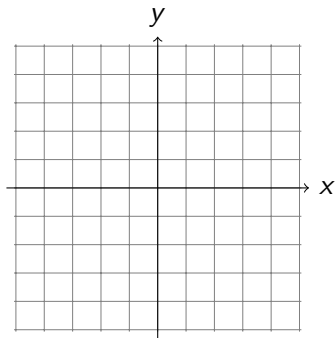


Examples

- Find an angle between 0° and 360° that is coterminal with the angle 775° .
- Find the reference angle associated with the angle 210° .



Coterminal Angles and Reference Angles in Radians



Examples

- Find an angle between 0 radians and 2π radians that is coterminal with the angle $\frac{17\pi}{6}$ radians.
- Find the reference angle associated with the angle $\frac{15\pi}{18}$.

