Topic 7.3 Exponential Models

Essential Question:

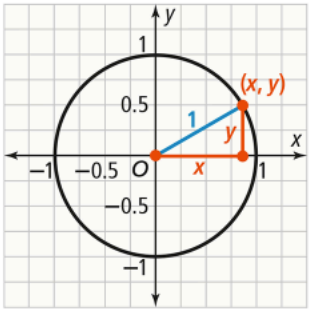
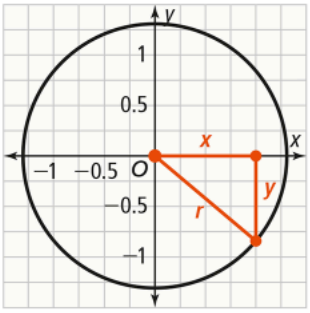
How is the unit circle related to trigonometric functions?

Explore & Reason

Complete online.

CONCEPT Summary: Trigonometric Functions and the Unit Circle

A reference triangle is formed using the terminal side of an angle and a perpendicular segment from the terminal point to the *x*-axis. This can help you find the coordinates of the terminal point on the unit circle.

	Trigonometric Functions on the Unit Circle	Trigonometric Functions on Any Circle
GRAPHS		
WORDS	For an angle with measure θ in standard position with terminal point (x, y) on the unit circle: $\sin\theta = y$ $\csc\theta = \frac{1}{y}$ $\cos\theta = x$ $\sec\theta = \frac{1}{x}$ $\tan\theta = \frac{y}{x}$ $\cot\theta = \frac{x}{y}$	For an angle with measure θ in standard position with terminal point (x, y) on any circle: $\sin\theta = \frac{y}{r}$ $\csc\theta = r \cdot \frac{1}{y}$ $\cos\theta = \frac{x}{r}$ $\sec\theta = r \cdot \frac{1}{x}$ $\tan\theta = \frac{y}{x}$ $\cot\theta = \frac{x}{y}$

Q: How can you use transformations to describe the graph of $y = \cot x$, given the graph of $y = \tan x$? To describe the graph of $y = \csc x$, given the graph of $y = \sec x$?

Notes:

Examples & Questions

Examples 1

Q: How can you use the unit circle to find the signs of points on the graph of the tangent function?

Examples 2

Q: What do you notice about the graph of the tangent function?
Q: When is the function positive? Negative?
Q: How is a variable used to represent all values not in the domain of $y = \tan x$

Examples 3

Q: How does the value of *a* in $y = a \tan bx$ affect the graph of the parent function?
Q: How does the value of *b* in $y = a \tan bx$ affect the graph of the parent function?

Examples 4

Q: Does the asymptote of the function change when *a*=3?

Examples 5

Q: How are the secant and cosine functions relate?
Q: How are the graphs of the cosine and secant functions similar?

Practice and Problem Solving

Complete MathXL for School: Practice and Problem Solving (online)
Complete MathXL for School: Enrichment (online)

Challenge: #14, 25 – key will be posted in Power School Learning.

Lesson Quiz 7.3 & Notes