Bellwork

For what values on the interval $[-2\pi, 2\pi]$ is $y = \tan x$ undefined?

\[
\frac{-\pi}{2}, \frac{-3\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2}
\]

ACT question:
If a right triangle has legs of length $5x$ and $x$, which of the following expressions represents the length of its hypotenuse in terms of $x$?

A) $2x$  
B) $5x$  
C) $x\sqrt{6}$  
D) $2x\sqrt{6}$  
E) $x\sqrt{26}$

\[
x^2 + (5x)^2 = x^2 + 25x^2 = \sqrt{26x^2}
\]

4.6 day 1 assignment

p. 337 # 16, 18, 27, 28, 31, 43, 49, 52

16) Per = \[\frac{\pi}{4}\]  
18) Per = 1, asymp: $x = -1/2, 1/2$

27) Per = \[\frac{\pi}{3}\], asymp: $x = 0, x = \frac{\pi}{2}$  
28) Per = 2, asymp: $x = 0, x = 2$
4.6 Day 2 Graphing
Secant and Cosecant

GOAL: graph secant and cosecant using cosine and sine.
Graphing CSC

To graph $y = \csc x$ sketch the graph of $\sin x$

Cosecant is undefined when $\sin x = 0$

$x$-intercepts become asymptotes

Graphing SEC

To graph $y = \sec x$ sketch the graph of $\cos x$

Secant is undefined when $\cos x = 0$

$x$-intercepts become asymptotes

*Period = $2\pi$*

*Same as cosine*
General Equations

\[ y = a \csc(bx - c) + d \quad y = a \sec(bx - c) + d \]

In calculator

\[ y = \frac{a}{(\sin(bx-c)+d)} \]

*Reflection* → graph \( \sin \) or \( \cos \)

\( \csc \) + sec

Example 1: Graph the cosecant and secant functions.

\[ y = 2 \csc\left(x + \frac{\pi}{4}\right) \]

\( \text{amp} = 2 \)

Period = \( \frac{2\pi}{b} = \frac{2\pi}{1} = 2\pi \)

\[ \frac{2\pi}{4} \]

\[ x + \frac{\pi}{4} = 0 \]

\[ x + \frac{\pi}{4} = \pi \]

\[ x + \frac{\pi}{4} = \frac{3\pi}{2} \]

\[ x + \frac{\pi}{4} = \frac{5\pi}{2} \]
Example 1: Graph the cosecant and secant functions.

\[ y = \sec 2x \]

\[ \text{cos} : \text{amp} = 1 \]

\[ \text{Per} = \frac{2\pi}{2} = \pi \]

\[ 4x = -\frac{3\pi}{2} \]

\[ 4x = -\pi \rightarrow x = -\frac{\pi}{4} \]

\[ 2x = \frac{\pi}{2} \rightarrow x = \frac{\pi}{4} \]

4.6 day 2 assignment

p. 337 # 21, 23, 35, 36, 65, 96-98