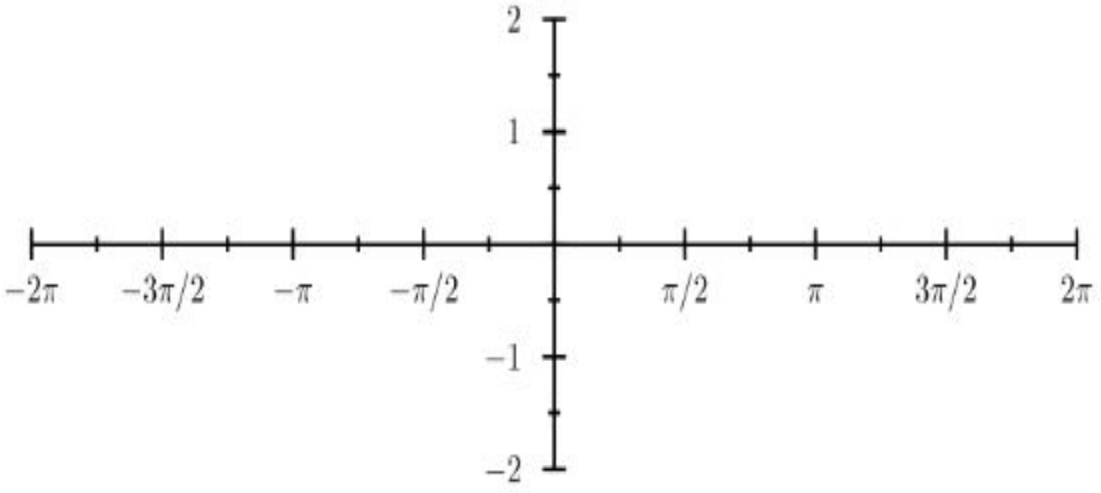
CW#___ Name:_____

2.3.3 What about tan(x)?

Graphs of Tangent and Inverse Tangent

#147

a. Graph $f(x) = \tan(x)$ using your table from problem #56



b. Using the fact that $\tan(x) = \frac{\sin(x)}{\cos(x)}$, what happens to the function $f(x) = \tan(x)$ when $\cos(x) = 0$?

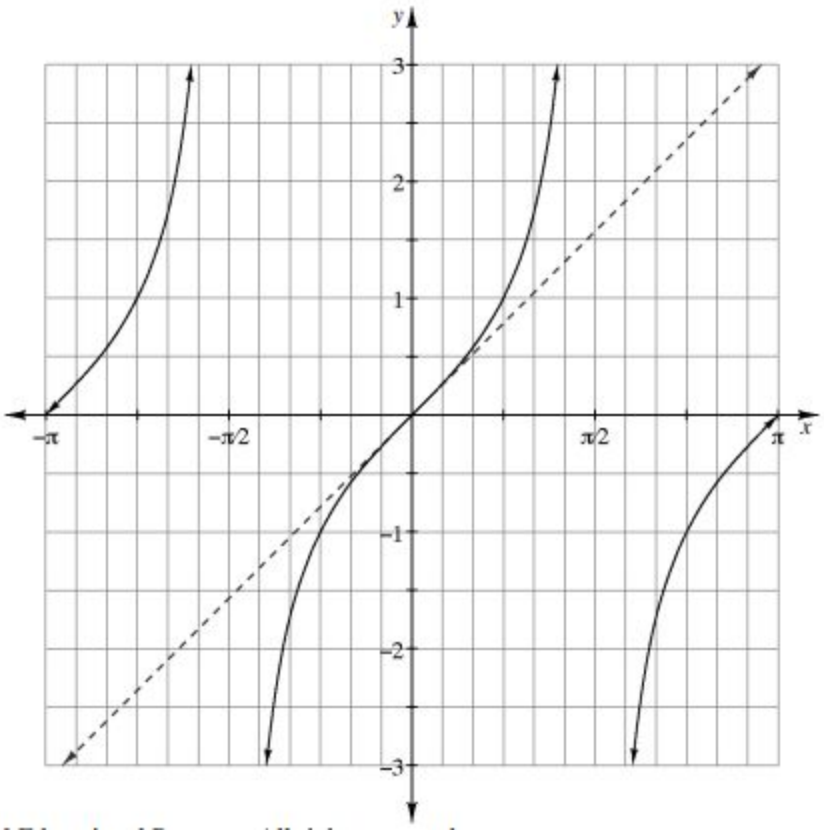
Locate all of the x-values over the interval $-2\pi \le x \le 2\pi$ where this occurs and sketch the result on the resource page.

c. What happens to $f(x) = \tan(x)$ when $\sin(x) = 0$?

Locate all of the x-values over the interval $-2\pi \le x \le 2\pi$ where this occurs and sketch the result on the resource page.

#148 PROPERTIES OF $f(x) = \tan(x)$	
a. What is the domain of $f(x) = \tan(x)$? Which function affects the domain, sine or cosine?	b.What is the range of $f(x) = \tan(x)$? Is this the same or different than the range for sine and cosine? Why?
c. What are the x-intercepts of the function? Which function helps determine these intercepts, sine or cosine?	d. Explain why $f(x) = \tan(x)$ has asymptotes. Write the equations of the asymptotes.
e. What is the period of $f(x) = \tan(x)$? Is this the same or different than the period for sine and cosine? Why?	f. Is $f(x) = \tan(x)$ even, odd, or neither? Use multiple representations to justify your answer.

#149 Now that you have drawn the graph of $f(x) = \tan(x)$, you can sketch a graph of its inverse, $g(x) = \tan^{-1}(x)$. Use the carbon copy method that you used in the previous lesson when sketching $y = \sin^{-1}(x)$ and $y = \cos^{-1}(x)$.



a. Is the graph $g(x) = \tan^{-1}(x)$ a function?

b. What needs to be done so that $g(x) = \tan^{-1}(x)$ is a function?

c. State a possible domain and range for the function $g(x) = \tan^{-1}(x)$.

d. Use a graphing calculator to check your answer to part (c).