Trig Derivatives

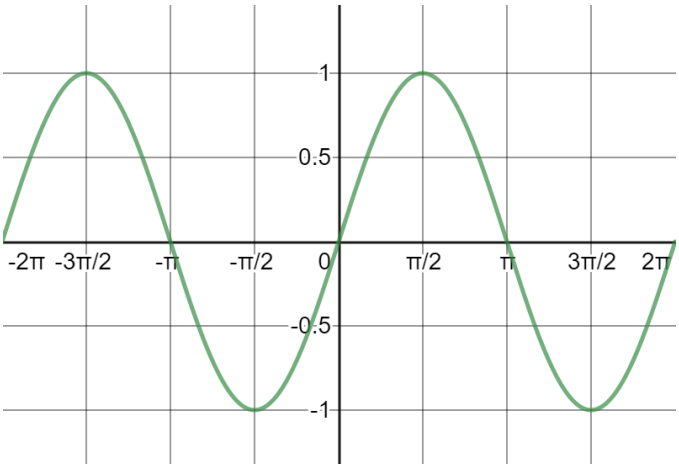
Goal: • Understands the relationship between sine and cosine regarding the derivative. • Can find the derivative of all 6 trig functions using derivative rules.
Terminology: • None
Reminder: • Quiz on Thursday on derivative rules 3.3-3.6

Review: Illustrate the quotient rule, that is show why

$$\left(\frac{f}{g}\right)' = \frac{f'g - g'f}{g^2}$$

During our tour of derivative rules we want to be able to take the derivative of any function. Currently with power rule and product/quotient rule any polynomial or rational function we can find the derivative of easy. But that still leaves trig functions, exponential functions and their inverse functions that we need to unpack.

Given the graph of sine, graph the derivatve, hypothesize the function of the derivative, then prove that is true using limits.



Proof that

$$\frac{d}{dx}\sin x =$$

Once we know the derivative of sine and cosine the 4 other trig derivatives follow because they are built with sine and cosine.

Function, $f(x)$	$f(x) = g(\sin x, \cos x)$	Derivative, $f'(x)$
$\tan x$		
$\sec x$		
$\csc x$		
$\cot x$		

Practice Problems: 3.5: # 1-10, 14, 18, 20, 26, 27, 36

 # 25, 30

In Class Evidence

10. If $y = \frac{\cos x}{1+\sin x}$ then determine $\frac{dy}{dx}$. Use your graphing calculator to confirm your answer.

14. Use the definition of the derivative to prove that $\frac{d}{dx}\cos x = -\sin x$

25. Follow the guiding questions in your book to show why the trig derivatives depend on using radian unit of measurements.

36. Find A and B such that if $y = A\sin x + B\cos x$ then $y'' - y = \sin x$