# Today's Plan:

***Learning Target (standard)***: I will graph derivatives of functions and describe their properties.

***Students will***: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make neccessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

***Teacher will***: Provide practice problems over previous concepts, check homework problems for accuarcy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

***Assessment***: Board work, homework check and homework assignment

***Differentiation***: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

## Find the derivative.

$f(x) = \cos^3(\tan 2x)$ $= (\cos(\tan 2x))^3$

$f'(x) = -3\cos^2(\tan 2x) \cdot \sin(\tan 2x) \cdot 2\sec^2 2x$

$f'(x) = -6\cos^2(\tan 2x)\sin(\tan 2x)\sec^2 2x$

Find the derivative.

$$f(x)=\ln\left[\frac{\sqrt[4]{x-5}(3x-4)^2}{2x^3}\right]$$

$f(x)=\frac{1}{4}\ln(x-5)+2\ln(3x-4)-\ln 2-3\ln x$

$f'(x)=\frac{1}{4}\left(\frac{1}{x-5}\right)+2\left(\frac{3}{3x-4}\right)-0-3\left(\frac{1}{x}\right)$

$=\frac{1}{4(x-5)}+\frac{6}{3x-4}-\frac{3}{x}$ $\quad -12(x-5)(3x-4)$ $\quad -12(3x^2-19x+20)$

$=\frac{3x^2-4x+24x^2-120x-36x^2+228x-240}{4x(x-5)(3x-4)}$

$f'(x)=\frac{-9x^2+104x-240}{4x(x-5)(3x-4)}$

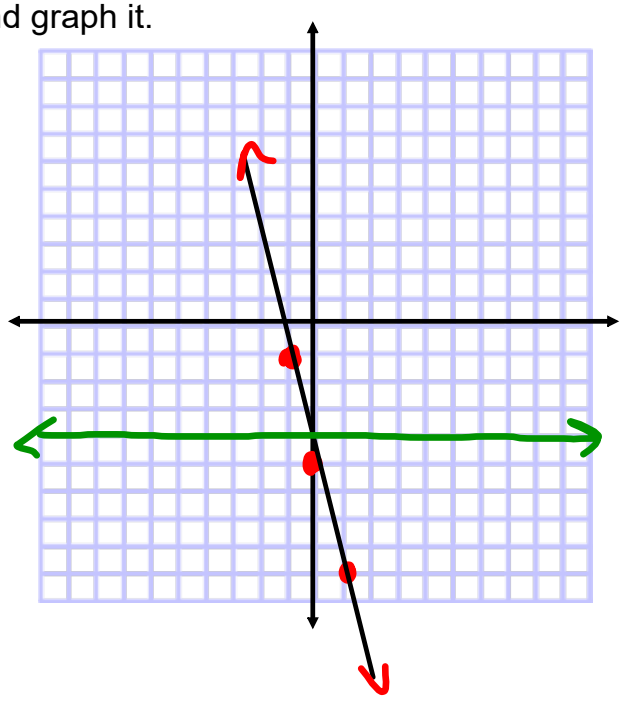
Graph the function. Find its derivative and graph it.

$$f(x)=-4x-5$$

$m=-4$

$I_y:(0,-5)$

$f'(x)=-4$



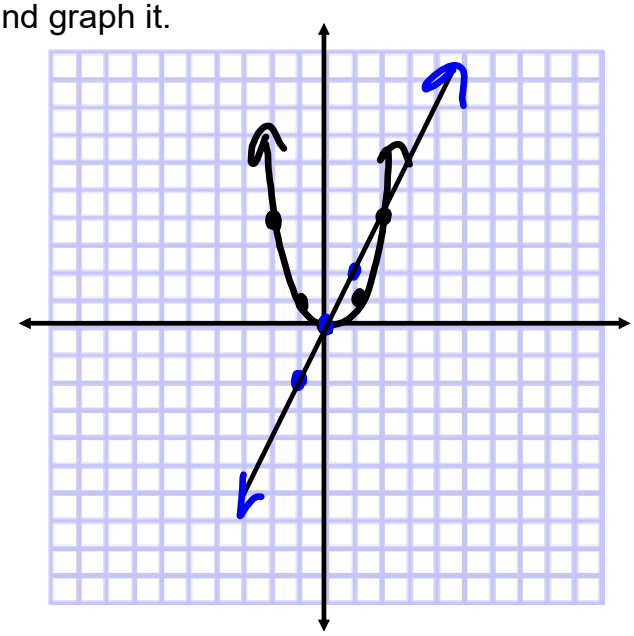
Graph the function. Find its derivative and graph it.

$$f(x) = x^2$$

$f'(x) = 2x$

$m = 2$

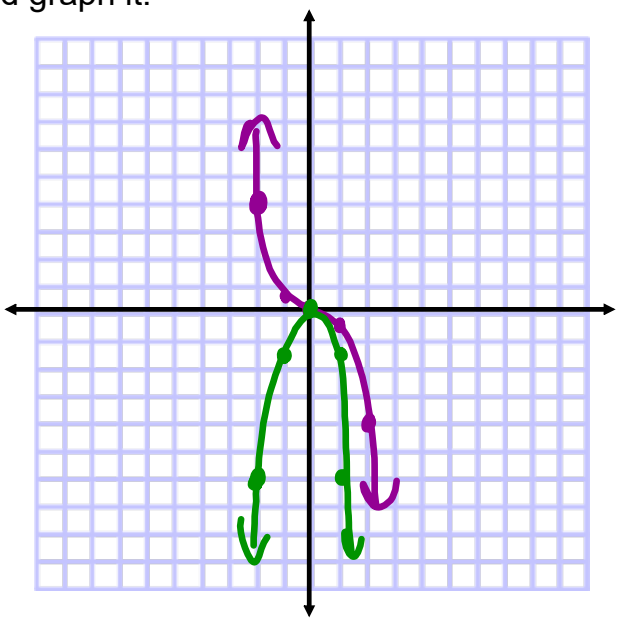
$I_y: (0,0)$



Graph the function. Find its derivative and graph it.

- $f(x) = -\frac{1}{2}x^3$

$f'(x) = -\frac{3}{2}x^2$

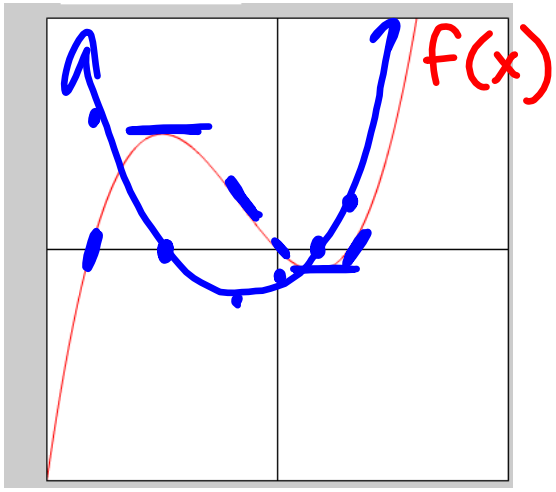


## Graphs of Derivatives:

- the graph of the derivative is the graph of the values of the slopes of the tangent lines to the function
- determine where the function would have horizontal tangent lines
- determine where the function would have tangent lines that have positive slopes
- determine where the function would have tangent lines that have negative slopes

## Graphs of Derivatives:

Derivative Plotter



## Graphs of Derivatives Assignment:

- Watch the following videos on Khan Academy

https://www.khanacademy.org/math/

ap-calculus-ab/ab-derivatives-analyze-functions/

ab-connecting-func-and-derivatives/v/intuitively-drawing-the-derivative-of-a-function

https://www.khanacademy.org/math/ap-calculus-ab/ab-derivatives-analyze-functions/

ab-connecting-func-and-derivatives/v/identifying-a-function-s-derivative-example

- Use the information to write a step-by-step process for sketching the derivatives of functions

- Use the information to complete Derivatives Supplemental Questions Set 2