

## Using the Graphing Calculator to Find Derivatives

### From the Graph Screen

- 1) Place the function into Y=
- 2) Be sure the x-value to be evaluated is in the viewing window of the graph
- 3) Press  $2^{\text{nd}}$ , Calc (trace key),  $\frac{dy}{dx}$  (6), the x-value you want the slope calculated, ENTER

### From the Home Screen

Press MATH, nDeriv(8), functional expression used, comma key(,) , X, the x-value you want the slope calculated, right parentheses key , ENTER

EX)  $\text{nDeriv}(3x^2 - 2x + 1, x, 3)$  will find the slope of  $f(x) = 3x^2 - 2x + 1$  at  $x = 3$ .

NOTE: Graphing Calculator can only EVALUATE the derivative for values of x. It cannot give you the derivative itself(as a function)

Sneaky way to have the calculator sketch the graph of the derivative function using the Y= function of the graphing calculator:

$Y = \text{nDeriv}(function, x, x)$

EX) Graph  $Y = \text{nDeriv}(3x^2 - 2x + 1, x, x)$  and the graph for  $y = 6x - 2$  should appear!

## Using the Graphing Calculator to Draw a Tangent Line

- 1) Place the function into Y=
- 2) Be sure the  $x$ -value of the point of tangency is in the viewing window of the graph
- 3) Press **2<sup>nd</sup>**, **Draw** (PRGM key), **Tangent**(5), the  $x$ -value of the point of tangency, **ENTER**

The tangent line will be drawn on the graph and its equation should appear at the bottom in  $y = mx + b$  form.

Note: There is no way to trace on the tangent line or any other creation from the DRAW menu of the graphing calculator.

### BE CAREFUL!

The graphing calculator cannot take the place of your brain and will give numeric answers for derivatives that DO NOT EXIST (sharp points) .

EX) Graph  $y = x^{2/3}$  and find the derivative at  $x = 0$ .