$$\underline{f(x)} \qquad\qquad \underline{f'(x)}$$

derivatives are linear

$$\begin{cases} f(x) + g(x) \\ f(x) - g(x) \\ c \cdot f(x) \end{cases}$$

$$f(x) + c$$

$$\left. \begin{array}{l} f'(x) + g'(x) \\ f'(x) - g'(x) \end{array} \right\} \text{can do separately if two functions are added, subtracted}$$

$$c \cdot f'(x) \leftarrow \text{pull constants multiplied "out in front"}$$

$$f'(x) + 0 \leftarrow \text{constants ADDED have derivative 0}$$

Power Rule $\qquad x^p \qquad\qquad px^{p-1}$

$$x \qquad\qquad 1$$

$$e^x \qquad\qquad e^x$$

$$a^x \qquad\qquad ln(a) \cdot a^x$$

$$ln(x) \qquad\qquad \frac{1}{x}$$

$$log_a(x) \qquad\qquad \frac{1}{x \, ln(a)}$$

$$sin(x) \qquad\qquad cos(x)$$

$$cos(x) \qquad\qquad -sin(x)$$

$$tan(x) \qquad\qquad sec^2(x)$$

$$sec(x) \qquad\qquad sec(x) tan(x)$$

$$cot(x) \qquad\qquad -csc^2(x)$$

$$csc(x) \qquad\qquad -csc(x) cot(x)$$

Product Rule $\qquad f(x) \cdot g(x) \qquad \curvearrowright f(x)g'(x) + g(x)f'(x)$ "

"one D-two plus two D-one"

Quotient Rule $\qquad \dfrac{f(x)}{g(x)} \qquad\qquad \dfrac{g(x)f'(x) - f(x)g'(x)}{g(x)^2}$

"low D-high minus high D-low over square what's below"

Above this line, need to know for EXAM #1

$$Arctan(x) \qquad\qquad \frac{1}{1+x^2}$$

$$Arcsin(x) \qquad\qquad \frac{1}{\sqrt{1-x^2}}$$

$$Arcsec(x) \qquad\qquad \frac{1}{|x|\sqrt{x^2-1}}$$

$$Arccot(x) \qquad\qquad \frac{-1}{1+x^2}$$

$$Arccos(x) \qquad\qquad \frac{-1}{\sqrt{1-x^2}}$$

$$Arccsc(x) \qquad\qquad \frac{-1}{|x|\sqrt{x^2-1}}$$

These are the negatives of the first three listed above. Use this fact to remember only 3 not 6 formulas