

<p>Alan Tupaj Vista Murrieta High School Website: www.vmhs.net (Click on Teachers then Alan Tupaj)</p>	<p>Basic Derivative Rules AP Readiness Session 1 Answers to examples posted on my website</p>
<p><u>Derivative Rules</u></p>	<p><u>Examples</u>: For each function, find $f'(x)$</p>
<p>Derivative of a constant:</p> $\frac{d}{dx}(c) = 0$	$f(x) = 3$
<p>Derivative of a variable to a power:</p> <p><u>Power Rule</u></p> $\frac{d}{dx}(x^n) = nx^{n-1}$	$f(x) = x^5$ $f(x) = \frac{1}{x^3}$ $f(x) = \sqrt{x^3}$ $f(x) = \frac{1}{\sqrt[3]{x^4}}$
<p>Derivative of the sum or difference of functions:</p> $\frac{d}{dx}(f(x) \pm g(x)) = f'(x) \pm g'(x)$	$f(x) = 2x^3 - 5x^2 + 3x - 8$
<p>Derivative of a product of two functions:</p> <p><u>Product Rule</u></p> $\frac{d}{dx}(f(x)g(x)) = f(x)g'(x) + g(x)f'(x)$	$f(x) = (5x^2 - 2)(x^3 + 4x^2 + 3)$
<p>Derivative of the quotient of two functions:</p> <p><u>Quotient Rule</u></p> $\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) = \frac{g(x)f'(x) - f(x)g'(x)}{(g(x))^2}$	$f(x) = \frac{x^3 - 2x}{3x - 4}$

<p>Division with Monomial Denominator</p> <p>Distribute the monomial in the denominator</p>	$f(x) = \frac{x^5 - 7x^4 + 2x^3 - x^2 + 5}{x^3}$
<p>Application: Equation of a tangent line</p> <p>Given x_1, substitute into the function to find y_1</p> <p>Substitute into the derivative to find m</p> <p>Tangent line: $y - y_1 = m(x - x_1)$</p>	<p>Find the equation of the line that is tangent to the function</p> $f(x) = 2x^3 - 3x^2 + 5 \text{ at } x = 2$