

	<p>Using Algebra and the <u>Product Rule</u> to take a derivative</p> <p>J) <math>y = (x^2 + 3)(x^3 - x)</math></p> <p><math>y = x^5 - x^3 + 3x^3 - 3x</math></p> <p><math>y = x^5 + 2x^3 - 3x</math></p> <p><math>y' = 5x^4 + 6x^2 - 3</math></p>	<p><math>(f(x) \cdot g(x))' = (dy/dx) \cdot 2^{nd} \text{ fact} + (2^{nd} \text{ fact}) \cdot (derivative \text{ of } f(x))</math></p> <p>J) <math>y = (x^2 + 3)(x^3 - x)</math></p> <p><math>y' = (x^2 + 3)(3x^2 - 1) + (x^3 - x)(2x)</math></p> <p><math>y' = 3x^4 - x^2 + 9x^2 - 3 + 2x^4 - 2x^2</math></p> <p><math>y' = 5x^4 + 6x^2 - 3</math></p>
	<p>Using Algebra and the Quotient Rule to take a derivative</p> <p>K) <math>f(x) = \frac{x^3 + 9}{x}</math></p> <p><math>f(x) = x^2 + 9x^{-1}</math></p> <p><math>f'(x) = 2x^1 - 9x^{-2}</math></p>	<p><math>f(x) = \frac{(x^3 + 9)}{(x)}</math></p> <p><math>f'(x) = \frac{x(3x^2) - (x^3 + 9)(1)}{x^2}</math></p> <p><math>f'(x) = \frac{3x^3 - x^3 - 9}{x^2}</math></p> <p><math>f'(x) = \frac{2x^3 - 9x^0}{x^2}</math></p>
	<p>Take the Derivative of the function</p> <p>L) <math>y = (x^2 + x + 2)(x^5 + x^3 + 5x)</math></p> <p><math>y = x^7 + x^5 + 5x^3 + x^6 + x^4 + 5x^2 + 2x^5 + 2x^3 + 10x</math></p> <p><math>y = x^7 + x^6 + 3x^5 + x^4 + 7x^3 + 5x^2 + 10x</math></p> <p><math>y' = 7x^6 + 6x^5 + 15x^4 + 4x^3 + 21x^2 + 10x + 10</math></p>	

Calc  
Quotient  
Rule

Alg

Take the Derivative of the function

$$M) f(x) = \frac{x^4}{2-x^2}$$

$$f'(x) = \frac{(2-x^2)(4x^3) - (x^4)(-2x)}{(2-x^2)^2}$$

$$8x^3 - 4x^5 + 2x^5$$

$$f'(x) = \frac{-2x^5 + 8x^3}{(2-x^2)^2}$$

$$O) f(x) = \frac{(x+3)(x-4)}{(x+1)(x-3)}$$

$$f(x) = \frac{x^2 - x - 12}{x^2 - 2x - 3}$$

Quotient Rule

$$N) f(x) = (5-x^2)(3-x)^{-1}$$

$$f(x) = \frac{5-x^2}{3-x}$$

$$f'(x) = \frac{(3-x)(-2x) - (5-x^2)(-1)}{(3-x)^2}$$

$$-6x + 2x^2 + 5 - x^2$$

$$f'(x) = \frac{x^2 - 6x + 5}{(3-x)^2}$$

$$P) f(x) = \frac{\sqrt[3]{x} + 1}{\sqrt[3]{x} - 1}$$

$$f(x) = x^{-1}$$
$$f'(x) = -x^{-2}$$

$$f'(x) = \frac{1}{x}$$

$$f'(x) = \frac{x(0) - 1(1)}{x^2}$$
$$= \left(-\frac{1}{x^2}\right)$$