Name_____

Follow the online examples, these problems were created from the structure of those examples. Be prepared to walk the class through the steps of each problem. Work should be done on separate sheets of paper, organized, and planned out.

Examples: Power Rule

Find	Function	Exponential Form	Result
$f'(x)$	$f(x) = 5x^2 + 7x - 2$		
y'	$y = 3x^3 - 8x^2 + 2x - 4$		
$\frac{d}{dx}[f(x)]$	$\frac{d}{dx}\left(\frac{-2}{x^5} + \frac{5}{x^4} - \frac{6}{x^2} + \frac{3}{8}\right)$		
$D_x(y)$	$y = \frac{3}{x^4} - \frac{6}{x} + 2x - 190$		
$f'(x)$	$f(x) = \frac{25}{\left(\sqrt[3]{x-7}\right)^2}$		
$\frac{dy}{dx}$	$y = \frac{5}{(x-3)^2}$		
V(t)	$S(t) = 55t^2 - 6t + 129$		
$\frac{d^2y}{dx^2}$	$\frac{dy}{dx} = 3x^{\frac{2}{3}} - \frac{2}{3}x^{\frac{2}{5}} + 5x - \frac{4}{7}$		
$\frac{d^3g}{dx^3}$	$g'(x) = 8x^4 - 2x^3 - 9x^2 + x - 32$		

Examples: Product Rule

Find	Function	Final Result
$f'(x)$	$f(x) = 4x^2(x-5)^3$	
y'	$y = 5\pi x \cdot \cos x$	
$\frac{d}{dt}[f(t)]$	$\frac{d}{dt}\left((t-3)^4 \cdot (t+5)^8\right)$	
$D_z(y)$	$y = (z+3)^4 \cdot (z-5)^6 \cdot (z-7)^{10}$	
$\frac{dy}{dw}$	$y = \cos w \cdot \csc w$	
V(t)	$S(t) = 6t^2(\tan t) - 4t(\sec t) - 5$	
$\frac{d^2y}{dx^2}$	$\frac{dy}{dx} = 10x^{\frac{2}{5}}(x-4)^{\frac{1}{2}}$	
$\frac{d^3h}{dt^3}$	$h''(t) = (t-2)^5 \cdot (t+1)^3 \cdot (6t-7)$	

Examples: Quotient Rule

Find	Function	Final Result
$g'(\lambda)$	$g(\lambda) = \frac{\lambda}{1-\cos\lambda}$	
y'	$y = \frac{(x-5)^6}{(x+7)^3}$	
$\frac{d}{dx}[f(x)]$	$\frac{d}{dx}(\cot(x))$	
$D_h(y)$	$y = \left(\frac{5h-1}{3h+2}\right) \cdot (4h+1)$	
$\frac{dy}{dx}$	$y = \frac{\cos x}{1-\sin x}$	
V(t)	$S(t) = \frac{t^2-4t+7}{t+2} + 3t(t+1)^2 + 15$	
$\frac{d^2y}{dx^2}$	$\frac{dy}{dx} = 5x^2\left(2 - \frac{1}{x-3}\right)$	

Examples: Chain Rule

Find	Function	Final Result
$g'(\mu)$	$g(\mu) = 3\sec(5\mu^4)$	
y'	$y = \cos^3(x^2)$	
$\frac{d}{dx}[f(x)]$	$\frac{d}{dx}\left((4x^6 - 2)^7\right)$	
$D_h(y)$	$y = 4\sin^3(7x^2 - 2)^4$	
$\frac{d}{dx}[f(x)]$	$\frac{d}{dx}\left((3x^4 + 5)^6 \cdot (2x^3 - 3)^4\right)$	
V(t)	$S(t) = (3t^3 - 4)^5 \cdot (2t^2 - 9)^{10}$	
$\frac{d^2y}{dx^2}$	$\frac{dy}{dx} = 3\sin^3(2x^3) \cdot \cos^2(3x^4)$	
$\frac{dy}{dx}$	$y = \left(\frac{\cos(2h + 5)}{\sin(5h - 3)}\right)$	
$g'(\alpha)$	$g(\alpha) = \frac{(5\alpha^3 - 1)^6}{(3\alpha^4 - 4)^4}$	
$D_h(y)$	$y = \left(\frac{\sin^3(2h^4 - 7)}{\cos^2(3h^2 + 4)}\right)$	