

Monday, September 16

How is finding the derivative different from finding the average rate of change?



September 16

Students will verbally explain how to  
find the derivative

(using the words:  
function, exponent, coefficient...)

$$y = x^2 + 7x + 10$$

find  $y'$

$$y' = 2x + 7$$

$$y = x^2 + 7x + 10$$

$$y' = 2x + 7$$

$$y = (x + 5)(x + 2)$$

find  $y'$

$$y' = 1(x+2) + 1(x+5)$$

$$y' = x+2+x+5 = 7+2x$$

## Product Rule:

The derivative of the first function  
times

the second function

plus

The derivative of the second function  
times

the first function

Product  
Rule:

The derivative of the first function

times the second function

plus

The derivative of the second function

times the first function

$$\frac{d}{dx} (f(x) \cdot g(x)) = f'(x) g(x) + g'(x) f(x)$$

$$y = (3x^2 - 7)(12x^{-2} - 6x + 2)$$

find  $\frac{dy}{dx}$

$$\frac{dy}{dx} = (6x)(12x^{-2} - 6x + 2) + (-24x^{-3} - 6)(3x^2 - 7)$$

$$f(x) = (\sqrt{x} - 9x^2)\left(\frac{1}{x} + 10\right)$$

find  $f'(x)$

$$f(x) = (x^{\frac{1}{2}} - 9x^2)(x^{-1} + 10)$$

$$f'(x) = \left(\frac{1}{2}x^{-\frac{1}{2}} - 18x\right)(x^{-1} + 10) + (-1x^{-2})(x^{\frac{1}{2}} - 9x^2)$$