Do Now

Find the derivative for the following functions

$$h(x) = 3x^2 - \frac{4}{x^2} + 2\sqrt{x}$$

$h(x) = 3x^2 - 4x^{-2} + 2x^{\frac{1}{2}}$

$h'(x) = 6x + 8x^{-3} + x^{-\frac{1}{2}}$

$$f(x) = \frac{8x^3 + 4x^2 - 3}{x}$$

$f(x) = 8x^2 + 4x - 3x^{-1}$

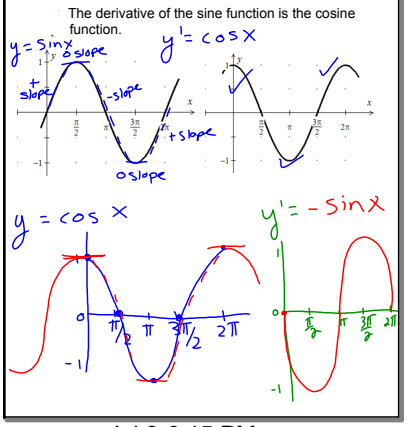
$f'(x) = 16x + 4 + 3x^{-2}$

Jul 8-6:14 PM

Derivatives of Sine and Cosine Functions:

$$\frac{d}{dx}[\sin x] = \cos x \quad \text{and} \quad \frac{d}{dx}[\cos x] = -\sin x$$

The derivative of the sine function is the cosine function.



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Differentiate

$f(x) = (x+2)(x-3)$

$f(x) = x^2 - 3x + 2x - 6$

$= x^2 - x - 6$

$f'(x) = 2x - 1$

Product Rule

$f(x) = (\overset{u}{x+2})(\overset{v}{x-3})$

$f'(x) = uv' + vu'$

$f'(x) = (x+2)(1) + (x-3)(1)$

$= x + 2 + x - 3$

$= 2x - 1$

Oct 16-9:50 AM

$f(x) = (\overset{u}{2x-1})(\overset{v}{x-4})$

$f'(x) = (2x-1)(1) + (x-4)(2)$

$= 2x - 1 + 2x - 8$

$= 4x - 9$

$y = (x^2 + 3x - 1)(2x^2 - 5)$

$y' = (x^2 + 3x - 1)(4x) + (2x^2 - 5)(2x + 3)$

$y' = 8x^3 + 18x^2 - 14x - 15$

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$g(x) = (\sin x)(4\sqrt{x})$

$g(x) = (\overset{u}{\sin x})(\overset{v}{4x^{\frac{1}{2}}})$

$g'(x) = uv' + vu'$

$g'(x) = (\sin x)(2x^{-\frac{1}{2}}) + (4x^{\frac{1}{2}})(\cos x)$

Oct 16-10:01 AM

$h(x) = (\cos x)(3x^2 + 2x - 1)$

$h'(x) = (\cos x)(6x + 2) + (3x^2 + 2x - 1)(-\sin x)$

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$$y = \overset{u}{2\sin x}\,\overset{v}{\cos x}$$

$$y' = (2\sin x)(-\sin x) + (\cos x)(2\cos x)$$
$$= -2\sin^2 x + 2\cos^2 x$$
$$= -2(\sin^2 x - \cos^2 x)$$

Oct 16-10:06 AM