Math 1431 Section 16679

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University of Houston

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# Questions

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• Find the limit: 
$$\lim_{x \to 2} \frac{x^2 - 4}{x^2 - 3x + 2}$$

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2 Find the limit: 
$$\lim_{x\to 1} \frac{x^2-4}{x^2-3x+2}$$

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• Find 
$$\lim_{x \to \infty} \frac{3x^2 - 7x + 1}{1 - x^2}$$

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# Test 1 Review

Problems from review sheet:

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If f and g are differentiable and c is a scalar, then f + g, f - g and  $(c \cdot f)$  are differentiable. Furthermore,

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If f and g are differentiable and c is a scalar, then f + g, f - g and  $(c \cdot f)$  are differentiable. Furthermore,

The derivative of the sum is the sum of the derivatives:

$$\frac{d}{dx}\left(f(x) + g(x)\right) = \frac{d}{dx}f(x) + \frac{d}{dx}g(x)$$

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If f and g are differentiable and c is a scalar, then f + g, f - g and  $(c \cdot f)$  are differentiable. Furthermore,

The derivative of the sum is the sum of the derivatives:

$$\frac{d}{dx}\left(f(x) + g(x)\right) = \frac{d}{dx}f(x) + \frac{d}{dx}g(x)$$

The derivative of the difference is the difference of the derivatives:

$$\frac{d}{dx}\left(f(x) - g(x)\right) = \frac{d}{dx}f(x) - \frac{d}{dx}g(x)$$

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If f and g are differentiable and c is a scalar, then f + g, f - g and  $(c \cdot f)$  are differentiable. Furthermore,

The derivative of the sum is the sum of the derivatives:

$$\frac{d}{dx}\left(f(x) + g(x)\right) = \frac{d}{dx}f(x) + \frac{d}{dx}g(x)$$

The derivative of the difference is the difference of the derivatives:

$$\frac{d}{dx}\left(f(x) - g(x)\right) = \frac{d}{dx}f(x) - \frac{d}{dx}g(x)$$

And the derivative of any scalar times a function is the scalar times the derivative of the function:

$$\frac{d}{dx}\left(c\cdot f(x)\right) = c\cdot \frac{d}{dx}f(x)$$

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Examples:

 $\ \, \bullet \ \, \frac{d}{dx} 8 =$ 

$$\ 2 \ \ \frac{d}{dx}x =$$

$$d \frac{d}{dx}(5x) =$$

$$\ \, \bullet \ \, \frac{d}{dx}(5x+2) =$$

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# Section 2.2 - Differentiation Formulas

The Power Rule:  $\frac{d}{dx}(x^n) = nx^{n-1}, \ n \neq 0$ 

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# Section 2.2 - Differentiation Formulas

The Power Rule:  $\frac{d}{dx}(x^n) = nx^{n-1}, \ n \neq 0$ 



$$\frac{d}{dx}(x^3) =$$

$$d \frac{d}{dx}(x^5 - x^2) =$$

$$\frac{d}{dx}(3x^4 + 2x^3 - 4x) =$$

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# Section 2.2 - Differentiation Formulas

More Examples: Find the derivative of each:

**5** 
$$f(x) = x^{9/7} + x^{5/7}$$

**6** 
$$y = \frac{1}{x^2}$$

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## • Find the derivative of $f(x) = 3x^2 + \sqrt{x} + x$ .

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•  $f(x) = 6x^2 - 2x + 1$ , f'(x) =

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