MTHSC 102 Section 3.2-3 – Simple Rate of Change Formulas

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Simple Derivative Rules

Rule Name	Function	Derivative
Constant Rule	$y = b$	$\frac{dy}{dx} = 0$
Linear Function Rule	$y = ax + b$	$\frac{dy}{dx} = a$
Power Rule	$y = x^n$	$\frac{dy}{dx} = nx^{n-1}$
Constant Multiple Rule	$y = kf(x)$	$\frac{dy}{dx} = kf'(x)$
Sum Rule	$y = f(x) + g(x)$	$\frac{dy}{dx} = f'(x) + g'(x)$
Difference Rule	$y = f(x) - g(x)$	$\frac{dy}{dx} = f'(x) - g'(x)$
Exponential Rule	$y = b^x \ (b > 0)$	$\frac{dy}{dx} = (\ln b)b^x$
e^x Rule	$y = e^x$	$\frac{dy}{dx} = e^x$
Natural Log Rule	$y = \ln(x), \ (x > 0)$	$\frac{dy}{dx} = \frac{1}{x}$

Example

Suppose that $f(x) = 3x^3 - 4x^2 + 3x + 5e^x - 8\ln(x)$. Give a formula for $f'(x)$.