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Quiz 6, Business Calculus

Summer Session I, 2012

Name: Key

1. (3 points) Find $f'(x)$ if $f(x) = 3e^{x^2-1}$.

$f'(x) = 3e^{x^2-1} \cdot 2x$

$= 6x e^{x^2-1}$

2. (3 points) Calculate the indefinite integral $\int (6x^3 + \frac{3}{x^2} - x)\,dx$ $= \int (6x^3 + 3x^{-2} - x)\,dx$

$= 6 \cdot \frac{1}{4}x^4 + 3(-1)x^{-1} - \frac{1}{2}x^2 + C$

$= \frac{3}{2}x^4 - \frac{3}{x} - \frac{x^2}{2} + C$

3. (4 points) Find $f'(x)$ if $f(x) = \ln\left(\frac{\sqrt{x}}{e^{3x^2}}\right)$.

$= \ln\sqrt{x} - \ln e^{3x^2}$

$f(x) = \frac{1}{2}\ln x - 3x^2$

$f'(x) = \frac{1}{2}\cdot\frac{1}{x} - 6x$

$= \boxed{\frac{1}{2x} - 6x}$