

# Quiz #5

Please print your name:

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**Problem 1. (12 points)** Compute the following derivatives.

[no need to show work]

(a)  $\frac{d}{dx} [x^5 - 3x^2] =$

(b)  $\frac{d}{dx} \frac{1}{x^4} =$

(c)  $\frac{d}{dx} e^{7x} =$

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

(e)  $\frac{d}{dx} \frac{x}{2 + \sin(x)} =$

(f)  $\frac{d}{dx} \sqrt{3 + \sin(5x)} =$

**Solution.**

(a)  $\frac{d}{dx} [x^5 - 3x^2] = 5x^4 - 6x$

(b)  $\frac{d}{dx} \frac{1}{x^4} = -\frac{4}{x^5}$  (or, equivalently,  $-4x^{-5}$ )

(c)  $\frac{d}{dx} e^{7x} = 7e^{7x}$

(d)  $\frac{d}{dx} [x^3 \cos(x)] = 3x^2 \cos(x) - x^3 \sin(x)$

(e)  $\frac{d}{dx} \frac{x}{2 + \sin(x)} = \frac{2 + \sin(x) - x \cos(x)}{(2 + \sin(x))^2}$

(f)  $\frac{d}{dx} \sqrt{3 + \sin(5x)} = \frac{5 \cos(5x)}{2\sqrt{3 + \sin(5x)}}$

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