Calculus I **Derivatives** **Spring 2015**

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1. Compute the derivative:

$$\text{(a) } (\sin^{-1}(x))^2 + \cos(x) \quad \text{(b) } \log_3(4x^2 - x) \quad \text{(c) } \pi^{(e^x)} \quad \text{(d) } \tan(x)^{\sin(x)}$$

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2. Let $f(x) = \tan^{-1}(x^2 - 3)$. Write the equation of the line tangent to $f(x)$ at $x = 2$.

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3. Let C be the curve $y^{2/3} + x^{2/3} = 8$. Write the equation of the line tangent to C at $y = 8$.

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4. Let $p(s) = 2^{3s}$ and $q(s) = 2^{-3s}$.

1. Find $p'(s)$ and $q'(s)$.
2. Find $p''(s)$ and $q''(s)$.
3. Find $p^{(n)}(s)$ and $q^{(n)}(s)$.