3B - Integral Calculus
Week 1

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In this course we're going to do a *lot* of integration, and once you learn how to do them, you'll find that they involve a lot of doing derivatives– backwards. So let's see how well we remember our derivatives from 3A:

1. Find the equation of the line tangent to the graph of $y = 6e^x$ at $x = 2$.

2. Suppose that $f(x) = 13e^x - ex^e$. Find $f'(3)$.

3. Let $f(x) = x^3 \ln(5 - 4x^3)$. Find $f'(x)$ and give the domain of f in interval notation.

4. Find $f'(x)$ if $f(x) = \ln\left(\sqrt{\frac{7x-8}{6x-7}}\right)$.

5. Suppose that $f(x) = \frac{7}{\ln(x^2+4)}$. Find $f'(1)$.

6. Let $g(x) = \ln\left(\frac{ex^3}{(x-6)^6}\right)$. Find $g'(x)$. (Hint: Apply the laws of logarithms to $g(x)$ before taking its derivative.)

7. Find $\frac{d}{dx}\big(\sin(e^{3x})\big)$.

8. Find the derivative of $-7\cos(\sin(x^1 1))$.