Formula-Sheet for Test 3(Math 1190_5W2):

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$$\frac{d}{dx}a^x = (\ln a)a^x \qquad \text{and} \qquad \frac{d}{dx}\log_a x = \frac{1}{\ln a}\cdot\frac{1}{x}$$

Elasticity: $$E(x) = -\frac{x \cdot D'(x)}{D(x)}.$$

Total revenue is increasing at those x-values for which $E(x) < 1$. Total revenue is decreasing at those x-values for which $E(x) > 1$. Total revenue is maximized at the value(s) for which $E(x) = 1$. Again, the demand is *inelastic* if $E(x) < 1$. The demand has *unit elasticity* if $E(x) = 1$. The demand has unit elasticity when revenue is at a maximum. The demand is *elastic* if $E(x) > 1$.

Revenue function: $$R(x) = x \cdot D(x).$$

Basic Integration Formulas:

- The *Constant Rule of Antidifferentiation* is $\int k \cdot dx = kx + C.$
- The *Power Rule of Antidifferentiation* is $\int x^n dx = \frac{1}{n+1}x^{n+1} + C, \text{ for } n \neq -1.$
- The *Natural Logarithm Rule of Antidifferentiation* is $\int \frac{1}{x}dx = \ln x + C, \text{ for } x > 0.$
- The *Exponential Rule* (base e) *of Antidifferentiation* is $\int e^{ax} = \frac{1}{a}e^{ax} + C, \text{ for } a \neq 0.$

P1. $\int kf(x)dx = k\int f(x)dx$

P2. $\int [f(x) \pm g(x)]dx = \int f(x)dx \pm \int g(x)dx$

The Area of a trapezoid is $A = \frac{1}{2}h\,(b_1+b_2)$ where h is the height of the trapezoid and b_1 and b_2 are the lengths of (parallel sides) the respective bases.

Definite Integral: $\int_a^b f(x)\,dx = F(b) - F(a)$ where F is an antiderivative of f.

Riemann Sums: The area of the region under the curve is *approximately* the sum of the areas of the rectangles.

Note: <u>Be familiar on how to calculate Riemann Sum!</u>