FINAL EXAM FORMULA SHEET

You may need some of the following formulas to help with the exam.

Trig Identities:

$$\sin(2x) = 2\sin x \cos x$$

$$\sin^2 x = \frac{1}{2}\left[1 - \cos(2x)\right]$$

$$\cos^2 x = \frac{1}{2}\left[1 + \cos(2x)\right]$$

Integration Formulas:

$$\int \tan(x)dx = \ln|\sec(x)| + C$$

$$\int \cot(x)dx = \ln|\sin(x)| + C$$

$$\int \sec(x)dx = \ln|\sec(x) + \tan(x)| + C$$

$$\int \csc(x)dx = -\ln|\csc(x) + \cot(x)| + C$$

$$\int b^x dx = \frac{1}{\ln b} b^x + C$$

Taylor polynomials:

$$P_n(x) = \sum_{k=0}^{n} \frac{f^{(k)}(a)}{k!}(x-a)^k$$

$$|R_n(x)| \leq \frac{\max|f^{(n+1)}(c)|}{(n+1)!}|x-a|^{n+1}$$

Common MacLaurin Series:

$$e^x = \sum_{k=0}^{\infty} \frac{x^k}{k!}, \quad x \in (-\infty, \infty)$$

$$\cos(x) = \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k}}{(2k)!}, \quad x \in (-\infty, \infty)$$

$$\sin(x) = \sum_{k=0}^{\infty} (-1)^k \frac{x^{2k+1}}{(2k+1)!}, \quad x \in (-\infty, \infty)$$

$$\frac{1}{1-x} = \sum_{k=0}^{\infty} x^k, \quad x \in (-1, 1)$$

$$\ln(1+x) = \sum_{k=0}^{\infty} (-1)^k \frac{x^{k+1}}{k+1}, \quad x \in (-1, 1]$$