

Math 2343: preliminaries

Calculus results that you should know:

$$\frac{d}{dx}x^r = rx^{r-1}, \quad \frac{d}{dx}\ln(x) = \frac{1}{x}, \quad \frac{d}{dx}e^{rx} = re^{rx}$$

$$\frac{d}{dx}\sin(x) = \cos(x), \quad \frac{d}{dx}\cos(x) = -\sin(x),$$

$$\int x^r dx = \frac{1}{r+1}x^{r+1} + c, \quad r \geq 0, \quad \int x^{-1} dx = \ln(x) + c, \quad \int e^{rx} dx = \frac{1}{r}e^{rx} + c$$

$$\int \sin(x) dx = -\cos(x) + c, \quad \int \cos(x) dx = \sin(x) + c$$

$$e^{\ln a} = a, \quad e^{a+b} = e^a e^b, \quad e^0 = 1$$

$$\ln(e^b) = b, \quad \ln(ab) = \ln(a) + \ln(b), \quad \ln(1) = 0$$

$$\sin(0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}) = 0, 1, 0, -1, \quad \cos(0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}) = 1, 0, -1, 0$$

$$\frac{d}{dx}uv = u'v + uv', \quad \int u'v dx = uv - \int uv' dx$$

$$\frac{d}{dx}f(g(x)) = f'(g(x))g'(x)$$

$$\sin^2(x) + \cos^2(x) = 1, \quad ax^2 + bx + c = 0 \rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$