

So you think you know calculus?

In order to understand differential equations, it is vital that you understand calculus. Work on these problems to refresh your memory. Be sure to review any of the parts which you do not understand after class. Please do not use your calculators or any integral tables. If you need help, ask your neighbor or Chris.

(1) Calculate

$$\frac{d}{dx} \left(\frac{e^{3x} \cdot \cos(x^2 + 1)}{\ln(5x)} \right).$$

(2) If $x^5 + y^3 + \cos(xy) - xy^2 = 4$, calculate $\frac{dy}{dx}$.

(3) Calculate the following integrals:

(a)

$$\int \frac{x}{x^2 + 1} dx$$

(b)

$$\int te^{t+1} dt$$

(c)

$$\int \frac{5}{\sqrt{64 - \theta^2}} d\theta$$

(d)

$$\int \frac{2y - 7}{y^2 - 10y + 25} dy$$

(e)

$$\int \frac{1}{x^2 - 8x + 19} dx$$