- Derivatives of inverse one-to-one functions: $(f^{-1})'(a) = \dfrac{1}{f'(f^{-1}(a))}$
- L'Hospital's rule 0/0 or ∞/∞ case: $\lim \dfrac{f(x)}{g(x)} = \lim \dfrac{f'(x)}{g'(x)}$
- Logarithmic and exponential functions. Recall the definition $\ln(x) = \int_1^x \frac{1}{t}dt$

$$\log_b(a) = \frac{\ln(a)}{\ln(b)} \qquad \ln(ab) = \ln(a) + \ln(b) \qquad \ln(a/b) = \ln(a) - \ln(b) \qquad \ln(a^r) = r\ln(a)$$

$$\frac{d}{dx}\ln(x) = \frac{1}{x} \qquad \frac{d}{dx}\log_b(x) = \frac{1}{x\ln(b)} \qquad \frac{d}{dx}e^x = e^x \qquad \frac{d}{dx}a^x = a^x\ln(a)$$

- Compound interest, continuously compounded interest (and exp growth), exp decay:

$$A(t) = A_0\left(1 + \frac{r}{n}\right)^{nt} \qquad A(t) = A_0e^{rt} \qquad A(t) = A_0e^{-kt}$$

- Trig functions:

$$\frac{d}{dx}\sin(x) = \cos(x) \qquad \frac{d}{dx}\tan(x) = \sec^2(x) \qquad \frac{d}{dx}\sec(x) = \sec(x)\tan(x)$$

$$\frac{d}{dx}\cos(x) = -\sin(x) \qquad \frac{d}{dx}\cot(x) = -\csc^2(x) \qquad \frac{d}{dx}\csc(x) = -\csc(x)\cot(x)$$

- Inverse trig functions:

$$\frac{d}{dx}\sin^{-1}(x) = \frac{1}{\sqrt{1-x^2}} \qquad \frac{d}{dx}\tan^{-1}(x) = \frac{1}{1+x^2} \qquad \frac{d}{dx}\sec^{-1}(x) = \frac{1}{|x|\sqrt{x^2-1}}$$

$$\frac{d}{dx}\cos^{-1}(x) = -\frac{1}{\sqrt{1-x^2}} \qquad \frac{d}{dx}\cot^{-1}(x) = -\frac{1}{1+x^2} \qquad \frac{d}{dx}\csc^{-1}(x) = -\frac{1}{|x|\sqrt{x^2-1}}$$

- Integration by parts (in various but equivalent forms), with and without bounds:

$$\int uv' = uv - \int u'v \qquad \int u(x)v'(x)dx = u(x)v(x) - \int u'(x)v(x)dx$$

$$\int udv = uv - \int vdu \qquad \int_a^b u(x)v'(x)dx = u(x)v(x)|_a^b - \int_a^b u'(x)v(x)dx$$

- Trig integrals:

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

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

- Trig sub identities (choose the appropriate one as needed):

$$\cos^2\theta = 1 - \sin^2\theta \qquad \tan^2\theta + 1 = \sec^2\theta \qquad \tan^2\theta = \sec^2\theta - 1$$

- May save you time: $\int \ln(x)dx = x\ln(x) - x + C$