

## Differentiation Rules

## Integration Rules

$$\frac{d}{dx}(c) = 0$$

$$\int 0 dx = c$$

$$\frac{d}{dx}(kx) = k$$

$$\int k dx = kx + c$$

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

$$\int kf'(x) dx = kf(x) + c$$

$$\frac{d}{dx}(x^n) = nx^{n-1}$$

$$\int x^n dx = \frac{x^{n+1}}{n+1} + c \text{ when } n \neq -1$$

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

$$\int \cos x dx = \sin x + c$$

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

$$\int \sin x dx = -\cos x + c$$

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

$$\int \sec^2 x dx = \tan x + c$$

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

$$\int \csc^2 x dx = -\cot x + c$$

$$\frac{d}{dx}(\sec x) = \sec x \tan x$$

$$\int \sec x \tan x dx = \sec x + c$$

$$\frac{d}{dx}(\csc x) = -\csc x \cot x$$

$$\int \csc x \cot x dx = -\csc x + c$$

$$\frac{d}{dx}(e^x) = e^x$$

$$\int e^x dx = e^x + c$$

$$\frac{d}{dx}(\ln x) = \frac{1}{x}, x > 0$$

$$\int \frac{1}{x} dx = \ln|x| + c$$

• Note if the integral has bounds we do not use +c.

• Always take derivative of your answer, before evaluating when integrating. Especially when you have trig functions!!!