

Lecture 4f

$$f(x) = x^3 + c \rightarrow f'(x) = 3x^2$$

$$f(x) = x^n \rightarrow f'(x) = nx^{n-1}$$

$$\int f(x) dx = f(x) + C$$

integral symbol sign \int integrand x^n differential dx antiderivative $\frac{x^{n+1}}{n+1} + C$ ($n \neq -1$)

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

$$\int x^0 dx = x^1$$

$k \in \mathbb{R}$

$$\int x^{-1} dx = \int \frac{dx}{x}$$

$$= \ln|x| + C$$

Ex

$$\int \frac{dx}{x^2} = \int x^{-2} dx$$

$$= \frac{x^{-1}}{-1} + C$$

$$= -\frac{1}{x} + C$$

$$\left(\frac{1}{x}\right)' = -\frac{1}{x^2}$$

Ex

$$\int 3\sqrt{x} dx = \int x^{1/2} dx$$

$$= \frac{3}{4} x^{4/3} + C$$

$$\frac{a}{a+b} + \frac{b}{a+b} = 1 = \frac{a+b}{a+b}$$