

Funciones Exponenciales

FUNCIÓN EXPONENCIAL NATURAL

$$D_x(e^x) = e^x$$

$$D_x(e^u) = e^u D_x u \text{ (Regla de la cadena)}$$

Ejemplos:

1. $D_x(e^{3x^2-4x+2})$

$$= e^{3x^2-4x+2} \frac{d}{dx} (3x^2 - 4x + 2)$$

$$= (6x - 4)e^{3x^2-4x+2}$$

2. $D_x(e^{\tan 2x})$

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

$$= 2 \sec^2 2x e^{\tan 2x}$$

3. $y = x^3 * e^{\sqrt{x}}$

$$y' = x^3 \frac{d}{dx} e^{\sqrt{x}} + e^{\sqrt{x}} \frac{d}{dx} (x^3)$$

$$= x^3 * e^{\sqrt{x}} \frac{d}{dx} \sqrt{x} + e^{\sqrt{x}} * 3x^2$$

$$= x^3 e^{\sqrt{x}} * \frac{1}{2\sqrt{x}} + 3x^2 e^{\sqrt{x}}$$

$$= \frac{1}{2} x^2 \sqrt{x} * e^{\sqrt{x}} + 3x^2 e^{\sqrt{x}} = \frac{1}{2} x^2 e^{\sqrt{x}} (\sqrt{x} + 6)$$

Funciones Exponenciales

FUNCIÓN EXPONENCIAL

$$D_x(a^x) = a^x \ln a$$

$$D_x(a^u) = a^u \ln a D_x u$$

Ejemplos:

1. $D_x(4^x)$

$$= 4^x \ln 4$$

1. $D_x(4^{5x})$

$$= 4^{5x} \ln(4) D_x(5x)$$

$$= 5 \ln 4 (4^{5x})$$

2. $D_x(2^{4\text{sen}x})$

$$= 2^{4\text{sen}x} \ln(2) D_x(4 \text{sen} x)$$

$$= 4 \ln(2) \cos x 2^{4\text{sen}x}$$

3. $y = 5^{x^2+5x-7}$

$$y' = 5^{x^2+5x-7} * \ln 5 \frac{d}{dx}(x^2 + 5x - 7)$$

$$= (2x + 5) 5^{x^2+5x-7} * \ln 5$$