

Bloque I. Función real de variable real  
**Tema 3 Cálculo diferencial**

## Ejercicios propuestos

Deriva las siguientes expresiones:

$$\text{I.3-1 } y = \left( \frac{1}{x^3} + \frac{1}{2x^2} + \frac{1}{2x} \right) e^x$$

$$\text{I.3-2 } y = \frac{\sqrt{x^2+1}+x}{\sqrt{x^2+1}-x} + \frac{\sqrt{x^2+1}-x}{\sqrt{x^2+1}+x}$$

$$\text{I.3-3 } y = \frac{1+x}{\sqrt{x^2+1}} e^{\arctag x}$$

$$\text{I.3-4 } y = x \arctag x - \frac{1}{2} \ln(1+x^2)$$

$$\text{I.3-5 } y = \frac{1}{2}(x-4)\sqrt{8x-x^2} + 8 \arcsen \frac{x-4}{4}$$

$$\text{I.3-6 } y = (1+x) \arctag \sqrt{x} - \sqrt{x} + 20$$

$$\text{I.3-7 } y = x \ln(4x^2-1) - 2x - \frac{1}{2} \ln \frac{2x-1}{2x+1}$$

$$\text{I.3-8 } y = \frac{1}{3} x^3 \arctag x - \frac{1}{6} x^2 + \frac{1}{6} \ln(x^2+1)$$

$$\text{I.3-9 } y = 2 \arctag \left( \sqrt{\frac{1-\cos x}{1+\cos x}} \right)$$

$$\text{I.3-10 } y = \arccos \left( \frac{1-x^2}{1+x^2} \right)$$

$$\text{I.3-11 } y = \sec(x) \cdot \tag(x) + \ln(\sec(x) + \tag(x))$$

$$\text{I.3-12 } y = (2x-3)\sqrt[3]{(x+1)^2}$$

$$\text{I.3-13 } y = \operatorname{arctag}\left(\frac{1-\operatorname{tag}x}{1+\operatorname{tag}x}\right)$$

$$\text{I.3-14 } y = \operatorname{arctag}\left(\frac{2a+x-a^2x}{1-2ax-a^2}\right) \text{ I.3}$$

$$\text{-15 } y = (\operatorname{sen}x)^{\cos x}$$

$$\text{I.3-16 } y = \sqrt[x]{x}$$

$$\text{I.3-17 } y = \left(\frac{1+x}{1-x}\right)^{\frac{1-x}{1+x}}$$

$$\text{I.3-18 } y = a^{x^n}$$

$$\text{I.3-19 } y = 2e^{\sqrt{x}}\left(x^{3/2}-3x+6x^{1/2}-6\right)$$

$$\text{I.3-20 } y = \operatorname{arcsen}\left(\frac{4}{e^{x^2}+4e^{-x^2}}\right)$$

$$\text{I.3-21 } y = a^{\operatorname{sen}^2x}$$

$$\text{I.3-22 } y = 2^{3-x}$$

$$\text{I.3-23 } y = \frac{1}{3^{\operatorname{sen}x}}$$

$$\text{I.3-24 } y = \sqrt[3]{1+x^3} \cdot \sqrt{1-x^2}$$

$$\text{I.3-25 } y = \sqrt{a^2+x^2}(\ln x-1) - \frac{a}{2} \ln \frac{\sqrt{a^2+x^2}-a}{\sqrt{a^2+x^2}+a}$$

$$\text{I.3-26 } y = \ln \frac{\sqrt[3]{3x^2+7}}{x^2\sqrt{2x+5}}$$

$$\text{I.3-27 } y = \ln \sqrt{\frac{\sqrt{1-\cos x} + \sqrt{1+\cos x}}{\sqrt{1-\cos x} - 3\sqrt{1+\cos x}}}$$

$$\text{I.3-28 } y = x-10+4\sqrt{x-1}+2\ln(x-\sqrt{x-1}) - \frac{4}{\sqrt{3}} \operatorname{arctag}\left(\frac{2\sqrt{x-1}-1}{\sqrt{3}}\right)$$

$$\text{I.3-29 } y = (2x-3)\sqrt[3]{(x+1)^2}$$

$$\text{I.3-30 } y = \ln \frac{x}{\sqrt{1+x^2}} - \frac{\operatorname{arctag}x}{x}$$

$$\text{I.3-31 } y = \sqrt{2x+1} \operatorname{tag}(\sqrt{2x+1}) + \ln(\cos \sqrt{2x+1})$$

$$\text{I.3-32 } y = e^{-x} \frac{\operatorname{sen}3x+3\cos 3x}{10}$$