

Soluciones

Tarea 5

$$(1) \quad y = \frac{\lg x^2}{x} \rightarrow y' = \frac{\frac{1}{x^2} \cdot \lg e \cdot 2x \cdot x - \lg x^2 \cdot 1}{x^2} = \frac{2 \lg e - \lg x^2}{x^2}$$

$$(4) \quad y = \frac{\sin(x^2+1)}{\sqrt{1-x^2}} \rightarrow y' = \frac{\cos(x^2+1) \cdot 2x \cdot \sqrt{1-x^2} - \sin(x^2+1) \cdot \frac{1}{2\sqrt{1-x^2}} \cdot (-2x)}{(\sqrt{1-x^2})^2}$$
$$= \frac{\cos(x^2+1) \cdot 2x \cdot \sqrt{1-x^2} + \frac{\sin(x^2+1) \cdot x}{\sqrt{1-x^2}}}{1-x^2}$$

$$(6) \quad y = \ln\left(\frac{x+1}{x}\right) \rightarrow y' = \frac{1}{\left(\frac{x+1}{x}\right)} \cdot \frac{1 \cdot x - (x+1) \cdot 1}{x^2} = \frac{x - x - 1}{(x+1) \cdot x} = \frac{-1}{(x+1) \cdot x}$$

$$(19) \quad y = \frac{e^{2x}}{1-5x} \rightarrow y' = \frac{e^{2x} \cdot 2 \cdot (1-5x) - e^{2x} \cdot (-5)}{(1-5x)^2} = \frac{e^{2x}(2-10x+5)}{(1-5x)^2} = \frac{e^{2x}(7-10x)}{(1-5x)^2}$$

$$(20) \quad y = \frac{x^3}{2x^2-4} \rightarrow y' = \frac{3x^2(2x^2-4) - x^3 \cdot 4x}{(2x^2-4)^2} = \frac{6x^4 - 12x^2 - 4x^4}{(2x^2-4)^2} = \frac{2x^4 - 12x^2}{(2x^2-4)^2}$$

$$(21) \quad y = \ln(\sqrt{x}) \rightarrow y' = \frac{1}{\sqrt{x}} \cdot \frac{1}{2\sqrt{x}} = \frac{1}{2(\sqrt{x})^2} = \frac{1}{2x}$$

$$(26) \quad y = \lg\left(\frac{x^2}{3-x}\right) \rightarrow y' = \frac{1}{\left(\frac{x^2}{3-x}\right)} \cdot \frac{2x(3-x) - x^2(-1)}{(3-x)^2} = \frac{6x - 2x^2 + x^2}{x^2(3-x)} = \frac{6x - x^2}{x^2(3-x)} = \frac{x(6-x)}{x^2(3-x)} = \frac{6-x}{x(3-x)}$$

$$(33) \quad y = \ln(3x+1) \rightarrow y' = \frac{1}{3x+1} \cdot 3 = \frac{3}{3x+1}$$

$$(48) \quad y = \ln\left(\frac{e^x+1}{e^x-1}\right) \rightarrow y' = \frac{1}{\left(\frac{e^x+1}{e^x-1}\right)} \cdot \frac{e^x(e^x-1) - (e^x+1) \cdot e^x}{(e^x-1)^2} = \frac{(e^x)^2 - e^x - (e^x)^2 - e^x}{(e^x+1) \cdot (e^x-1)} = \frac{-2e^x}{e^{2x}-1}$$

$$(49) \quad y = \frac{e^{2x}}{x^2} \rightarrow y' = \frac{e^{2x} \cdot 2 \cdot x^2 - e^{2x} \cdot 2x}{(x^2)^2} = \frac{e^{2x} \cdot 2x(x-1)}{x^4} = \frac{2e^{2x}(x-1)}{x^3}$$