

Soluciones:

Tarea 2

$$(31) \quad y = \frac{1}{7x+1} \rightarrow y' = \frac{0 \cdot (7x+1) - 1 \cdot 7}{(7x+1)^2} = \boxed{\frac{-7}{(7x+1)^2}}$$

$$(32) \quad y = \frac{2x}{x+3} \rightarrow y' = \frac{2(x+3) - 2x \cdot 1}{(x+3)^2} = \frac{2x+6-2x}{(x+3)^2} = \boxed{\frac{6}{(x+3)^2}}$$

$$(38) \quad y = \frac{x+5}{x-5} \rightarrow y' = \frac{1 \cdot (x-5) - (x+5) \cdot 1}{(x-5)^2} = \frac{x-5-x-5}{(x-5)^2} = \boxed{\frac{-10}{(x-5)^2}}$$

$$(39) \quad y = x^2 \lg x \rightarrow y' = \boxed{2x + \frac{1}{x} \lg e}$$

$$(43) \quad y = (x^4 - x^2) \cdot e^x \rightarrow y' = (4x^3 - 2x) \cdot e^x + (x^4 - x^2) \cdot e^x = \\ = e^x(4x^3 - 2x + x^4 - x^2) = \boxed{e^x(x^4 + 4x^3 - x^2 - 2x)}$$

$$(44) \quad y = (x^5 - x^3) \cdot \ln x \rightarrow y' = (5x^4 - 3x^2) \cdot \ln x + (x^5 - x^3) \cdot \frac{1}{x} = \\ = \boxed{(5x^4 - 3x^2) \cdot \ln x + x^4 - x^2}$$

$$(45) \quad y = \frac{x^2+x}{x^2-1} \rightarrow y' = \frac{(2x+1) \cdot (x^2-1) - (x^2+x) \cdot 2x}{(x^2-1)^2} = \\ = \frac{2x^3 - 2x + x^2 - 1 - 2x^3 - 2x^2}{(x^2-1)^2} = \frac{-x^2 - 2x - 1}{(x^2-1)^2} = \frac{-(x+1)^2}{(x^2-1)^2} = \\ = \frac{-(x+1)^2}{[(x+1) \cdot (x-1)]^2} = \frac{-(x+1)^2}{(x+1)^2 \cdot (x-1)^2} = \boxed{\frac{-1}{(x-1)^2}}$$

$$(52) \quad y = \sqrt[3]{x^2} + \sqrt{x} = x^{2/3} + x^{1/2} \rightarrow y' = \frac{2}{3} x^{-1/3} + \frac{1}{2} x^{-1/2} = \boxed{\frac{2}{3\sqrt[3]{x}} + \frac{1}{2\sqrt{x}}}$$

$$(53) \quad y = \frac{1}{x\sqrt{x}} = \frac{1}{x \cdot x^{1/2}} = \frac{1}{x^{3/2}} = x^{-3/2} \rightarrow y' = -\frac{3}{2} x^{-5/2} = \boxed{\frac{-3}{2\sqrt{x^5}}}$$