

$$(19) \frac{dy}{dx} = \frac{1}{x-3}$$

$$(20) \frac{dy}{du} = \frac{1}{u+100}$$

$$(21) \frac{dy}{dt} = \frac{-2}{3-2t}$$

$$(22) \frac{dy}{dy} = \frac{-5}{4-5y}$$

$$(23) \frac{dy}{dx} = (3e^{2x})(2) \\ = 6e^{2x}$$

$$(24) \frac{dy}{dy} = (2e^{3y})(3) \\ = 6e^{3y}$$

$$(25) \frac{dy}{dt} = (2e^{-4t})(-4) \\ = -8e^{-4t}$$

$$(26) \frac{dy}{dr} = (6e^{-3r})(-3) \\ = -18e^{-3r}$$

$$(27) \frac{dy}{dx} = (100e^{-0.03x})(-0.03) \\ = -3e^{-0.03x}$$

$$(28) \frac{dx}{dt} = (1,000e^{.06t})(.06) \\ = 60e^{.06t}$$

$$(29) y = \ln(x+1)^4 \\ y = 4 \ln(x+1) \\ y' = 4 \left( \frac{1}{x+1} \right) = \frac{4}{x+1}$$

$$(30) y = \ln(x+1)^{-3} \\ y = -3 \ln(x+1) \\ y' = -3 \left( \frac{1}{x+1} \right) = \frac{-3}{x+1}$$

$$(31) y' = (2e^{2x})(2) - 3e^x \\ y' = 4e^{2x} - 3e^x$$

$$(32) y' = (e^{-t})(-1) - (e^{-2t})(-2) \\ y' = -e^{-t} + 2e^{-2t}$$

$$(33) y' = (e^{3x^2-2x})(6x-2)$$

$$(34) y' = (e^{x^3-3x^2+1})(3x^2-6x)$$

$$(35) y' = \frac{2t+3}{t^2+3t}$$

$$(36) y' = \frac{3x^2-6x}{x^3-3x^2}$$

$$(37) y = \ln(x^2+1)^{\frac{1}{2}} \\ y = \frac{1}{2} \ln(x^2+1) \\ y' = \frac{1}{2} \left( \frac{2x}{x^2+1} \right) \\ y' = \frac{x}{x^2+1}$$

$$(38) y = \ln(x^4+5)^{\frac{3}{2}} \\ y = \frac{3}{2} \ln(x^4+5) \\ y' = \left( \frac{3}{2} \right) \left( \frac{4x^3}{x^4+5} \right) \\ y' = \frac{6x^3}{x^4+5}$$

$$(39) y = [\ln(t^2+1)]^4 \\ y' = 4 [\ln(t^2+1)]^3 \left( \frac{2t}{t^2+1} \right)$$

$$(40) y = [\ln(w^3-1)]^2 \\ y' = 2 [\ln(w^3-1)] \left( \frac{3w^2}{w^3-1} \right)$$

$$(41) y = (e^{2x}-1)^4 \\ y' = 4(e^{2x}-1)^3 (e^{2x})(2) \\ y' = 8e^{2x}(e^{2x}-1)^3$$

$$(42) y = (e^{x^2}+3)^5 \\ y' = 5(e^{x^2}+3)^4 (e^x)(2x) \\ y' = 10xe^{x^2}(e^{x^2}+3)^4$$

$$(43) y' = \frac{(x^2+1)(e^{2x})(2) - (2x)(e^{2x})}{(x^2+1)^2}$$

$$(44) y' = \frac{(x+1)(e^{x+1}) - (1)(e^{x+1})}{(x+1)^2}$$

$$(45) y' = (x^2+1)(e^{-x})(-1) + (2x)(e^{-x})$$

$$(46) y' = (1-x)(e^{2x})(2) + (-1)(e^{2x})$$

$$(47) y' = (e^{-x}) \left( \frac{1}{x} \right) + (e^{-x})(1) (\ln x)$$

$$(48) y' = (e^{x+1}) \left( \frac{1}{x} \right) + (e^{x+1})(1) (\ln x)$$

$$(49) y = [\ln(1+x^2)]^{-1} \\ y' = -1 [\ln(1+x^2)]^{-2} \left( \frac{2x}{1+x^2} \right)$$

$$(50) y = [\ln(1-x^3)]^{-1} \\ y' = -1 [\ln(1-x^3)]^{-2} \left( \frac{3x^2}{1-x^3} \right)$$

$$(51) y = [\ln(1-x^2)]^{\frac{1}{3}} \\ y' = \frac{1}{3} [\ln(1-x^2)]^{-\frac{2}{3}} \left( \frac{-2x}{1-x^2} \right)$$

$$(52) y = [\ln(1-t^5)]^{\frac{1}{5}} \\ y' = \frac{1}{5} [\ln(1-t^5)]^{-\frac{4}{5}} \left( \frac{-5t^4}{1-t^5} \right)$$

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$$63). \frac{d}{dx} \log_2(3x^2-1) = \left(\frac{1}{\ln 2}\right) \left(\frac{6x}{3x^2-1}\right)$$

$$64). \frac{d}{dx} \log(x^3-1) = \left(\frac{1}{\ln 10}\right) \left(\frac{3x^2}{x^3-1}\right)$$

$$65). \frac{d}{dx} 10^{x^2+x} = (10^{x^2+x})(2x+1)(\ln 10)$$

$$66). \frac{d}{dx} 8^{1-2x^2} = (8^{1-2x^2})(-4x)(\ln 8)$$

$$67). \frac{d}{dx} \log_3(4x^3+5x+7) = \left(\frac{1}{\ln 3}\right) \left(\frac{12x^2+5}{4x^3+5x+7}\right)$$

$$68). \frac{d}{dx} \log_5(5^{x^2-1}) = \frac{d}{dx} x^2-1 = 2x$$

$$69). \frac{d}{dx} 2^{x^3-x^2+4x+1} = (2^{x^3-x^2+4x+1})(3x^2-2x+4)(\ln 2)$$

$$70). \frac{d}{dx} 10^{\ln x} = (10^{\ln x}) \left(\frac{1}{x}\right) (\ln 10)$$