

201-103-RE - Supplement C: Derivatives of Logarithmic and Exponential Functions

Differentiate the following functions.

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| <p>(1) $y = x^9 + 9x - \sqrt[9]{x} + \frac{1}{9x} + 9^x - \log_9 x + 9^9$</p> <p>(3) $y = 2^x + 3^x + 4^x + 5^x + x^2 + x^3 + x^4 + x^5$</p> <p>(5) $y = \ln(5x) - \log_5(ex) + \ln(x^5) - \log_5(x^e)$; Hint: Combine logs first.</p> <p>(6) $y = 7^{3 \log_7(x+2)}$; Hint: Simplify first.</p> <p>(8) $y = 7^{4 \sin x + x^2}$</p> <p>(10) $y = 2^{x+3} \sin(\pi x)$</p> <p>(12) $y = \log_4(2x + \cos x)$</p> <p>(14) $y = \frac{\cos x}{\log_{13}(2x+1) + 3}$</p> | <p>(2) $y = \log 10^{x^2} + 10^{\log x^2}$; Hint: Simplify first.</p> <p>(4) $y = e^{3x} + 3^{e^x} + 3^{3x} + 3^{x^3}$</p> <p>(7) $y = 4^{2x} \sin(3x)$</p> <p>(9) $y = \tan(3^{3x} - 1)$</p> <p>(11) $y = 13^{\sin(2x-6)}$</p> <p>(13) $y = \sin(\log_5 x + \pi x)$</p> <p>(15) $y = \log_2(4 \sin x + e^{3x})$</p> |
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| <p>(1) $\frac{9x^8 + 9 - \frac{1}{9}x^{-10} + \frac{1}{9x^2} + 9^x \ln 9 - \frac{1}{9x} + 9^9 \ln 9}{x^2 \ln 13 + 3}$</p> <p>(3) $\left(x + \frac{\ln x}{1}\right) (x \ln 5 + x \ln 2)$</p> <p>(5) $(9 - x^2) \ln 13 + 9 - x^2 \ln 5$</p> <p>(6) $(1 - x^2) \ln 7$</p> <p>(7) $(x \ln 2 + x \ln 4) \sin(\pi x) + (x \ln 3) \cos(\pi x)$</p> <p>(8) $\frac{x \ln x}{1} - \frac{x}{9}$</p> <p>(9) $\frac{x \ln x}{1} - \frac{x}{9}$</p> <p>(10) $x \ln 2 + x \ln 3 + x \ln 4 + x \ln 5 + x \ln 6 + x \ln 7 + x \ln 8 + x \ln 9$</p> <p>(11) $\frac{x \ln 13}{1} - \frac{x}{9}$</p> <p>(12) $\frac{x \ln 4}{1} - \frac{x}{9}$</p> <p>(13) $\frac{x \ln 4}{1} - \frac{x}{9}$</p> <p>(14) $\frac{x \ln 4}{1} - \frac{x}{9}$</p> <p>(15) $\frac{x \ln 4}{1} - \frac{x}{9}$</p> | <p>(2) $\frac{2x \ln 10 + (1+x^2) \ln 10}{x \ln 2 + 3} - \frac{2 \ln(1+x^2)}{x \ln 2}$</p> <p>(4) $\frac{2x \ln 2 + x \ln 2}{x \ln 2}$</p> <p>(7) $(x \ln 2) \sin(\pi x) + (x \ln 3) \cos(\pi x)$</p> <p>(9) $(x \ln 2) \sin(\pi x) + (x \ln 3) \cos(\pi x)$</p> <p>(11) $(x \ln 2) \sin(\pi x) + (x \ln 3) \cos(\pi x)$</p> <p>(13) $(x \ln 2) \sin(\pi x) + (x \ln 3) \cos(\pi x)$</p> <p>(15) $(x \ln 2) \sin(\pi x) + (x \ln 3) \cos(\pi x)$</p> |
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