

Homework Math 140

Lecture 7

Will be quizzed Thursday Feb 28

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Problem 1 (Textbook page 408, problems 3-8). Find the exact value of each expression.

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| 1. $\log_5 125.$ | 5. $e^{\ln 4.5}.$ | 9. $\log_2 6 - \log_2 15 + \log_2 20.$ |
| 2. $\log_3 \frac{1}{27}.$ | 6. $\log_{10} 0.0001.$ | 10. $\log_3 100 - \log_3 18 - \log_3 50.$ |
| 3. $\ln\left(\frac{1}{e}\right).$ | 7. $\log_{1.5} 2.25.$ | 11. $e^{-2 \ln 5}.$ |
| 4. $\log_{10} \sqrt{10}.$ | 8. $\log_5 4 - \log_5 500.$ | 12. $\ln\left(\ln e^{e^{10}}\right).$ |

Problem 2 (Textbook, page 409, problem 27-36) Solve each equation for x . Using a calculator give an (\approx) answer in decimal notation. Using calculator verify your approximate solutions.

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| 1. $e^{6-4x} = 6.$ | 8. $\log_2(mx) = c.$ |
| 2. $\ln(3x - 10) = 2.$ | 9. $e - e^{-2x} = 1.$ |
| 3. $\ln(x^2 - 1) = 3.$ | 10. $10(1 + e^{-x})^{-1} = 3.$ |
| 4. $e^{2x} - 3e^x + 2 = 0.$ | 11. $\ln(\ln x) = 1.$ |
| 5. $2^{x-5} = 3.$ | 12. $e^{e^x} = 10.$ |
| 6. $\ln x + \ln(x - 1) = 1.$ | 13. $e^{2x} - e^x - 6 = 0.$ |
| 7. $e^{3x+1} = k.$ | 14. $\ln(2x + 1) = 2 - \ln x.$ |

Problem 3 (Textbook, page 410, problems 59-64) Find the inverse function.

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| 1. $y = \ln(x + 3).$ | 4. $y = (\ln x)^2, x \geq 1.$ |
| 2. $y = 2^{10^x}.$ | 5. $y = \log_{10}\left(1 + \frac{1}{x}\right).$ |
| 3. $f(x) = e^{x^3}.$ | 6. $y = \frac{e^x}{1+2e^x}.$ |

Problem 4 Find the inverse function. You are asked to do the algebra only; you are not asked to determine the domain and range of the function or its inverse.

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| • $f(x) = 3x^2 + 4x - 7$, where $x \geq -\frac{2}{3}.$ | • $f(x) = \frac{ax+b}{cx+d}, x \neq -\frac{d}{c}, ad - bc \neq 0, cx + d \neq 0.$ |
| • $f(x) = 2x^2 + 3x - 5$, where $x \geq -\frac{3}{4}.$ | • $f(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}}.$ |
| • $f(x) = ax^2 + bx + c$, where $x \leq -\frac{b}{2a}.$ | • $f(x) = 2^{2x} + 2^x - 2.$ |
| • $f(x) = \frac{2x+5}{x-4}, x \neq 4.$ | • $f(x) = 3^{4x} - 5 * 3^{2x} + 4, x \leq \log_3 \sqrt{\left(\frac{5}{2}\right)}.$ |
| • $f(x) = \frac{3x+5}{2x-4}, x \neq 2.$ | |