Algebra II Worksheet #4 Unit 11 Selected Solutions

Use the common base method to solve each of the equations. Show your work neatly organized.

3. $2^x = 0.25$

$2^x = 2^{-2}$

$x = -2$

5. $81^x = 27$

$(3^4)^x = 3^3$

$3^{4x} = 3^3$

$4x = 3$

$x = 3/4$

7. $2^{(3x-5)} = 8$

$2^{(3x-5)} = 2^3$

$3x - 5 = 3$

$3x = 8$

$x = 8/3$

10. $8^{(2x-1)} = 16^{(x+2)}$

$(2^3)^{(2x-1)} = (2^4)^{(x+2)}$

$2^{(6x-3)} = 2^{(4x+8)}$

$6x - 3 = 4x + 8$

$2x = 11$

$x = 5.5$

Use logarithms to solve each of the equations. Express your answers rounded to the nearest hundredth. Show your work neatly organized.

13. $6^{2x} = 3$

$\text{Log}(6^{2x}) = \text{Log } 3$

$2x\text{Log } 6 = \text{Log } 3$

$x = \dfrac{\text{Log } 3}{2\text{Log } 6} \approx 0.31$

17. $3^{(x+1)} = 5^{(2x-3)}$

$\text{Log}(3^{(x+1)}) = \text{Log}(5^{(2x-3)})$

$(x + 1)\text{Log } 3 = (2x - 3)\text{Log } 5$

$x\text{Log } 3 + \text{Log } 3 = 2x\text{Log } 5 - 3\text{Log } 5$

$x\text{Log } 3 - 2x\text{Log } 5 = -3\text{Log } 5 - \text{Log } 3$

$x(\text{Log } 3 - 2\text{Log } 5) = -3\text{Log } 5 - \text{Log } 3$

$x = \dfrac{-3\text{Log } 5 - \text{Log } 3}{\text{Log } 3 - 2\text{Log } 5} \approx 2.80$

18. $e^{3x} = 5$

$\ln(e^{3x}) = \ln(5)$

$3x \ln e = \ln 5$

$3x = \ln 5$

$x = \dfrac{\ln 5}{3} \approx 0.54$

19. $e^{(2x+1)} = 9$

$\ln(e^{(2x+1)}) = \ln 9$

$(2x + 1)\ln e = \ln 9$

$2x + 1 = \ln 9$

$2x = \ln 9 - 1$

$x = \dfrac{\ln 9 - 1}{2} \approx 0.60$