General Algebra 2 Worksheet #6 Unit 12 Selected Solutions

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

1. $3^x = 27$

$3^x = 3^3$

$x = 3$

3. $2^x = .25$

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

$x = -2$

5. $81^x = 27$

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

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

$4x = 3$

$x = 3/4$

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

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

$3x - 5 = 3$

$3x = 8$

$x = 8/3$

9. $10^{(4x-1)} = .001$

$10^{(4x-1)} = 10^{-3}$

$4x - 1 = -3$

$4x = -2$

$x = -1/2$

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

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

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

$6x - 3 = 4x + 8$

$2x = 11$

$x = 11/2$

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

11. $3^x = 5$

$\text{Log } 3^x = \text{Log } 5$

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

$x = \dfrac{\text{Log } 5}{\text{Log } 3} \approx 1.46$

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

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

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

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

15. $5^{(x+2)} = 50$

$\text{Log } 5^{(x+2)} = \text{Log } 50$

$(x + 2)\text{Log } 5 = \text{Log } 50$

$x\text{Log } 5 + 2\text{Log } 5 = \text{Log } 50$

$x\text{Log } 5 = \text{Log } 50 - 2\text{Log } 5$

$x = \dfrac{\text{Log } 50 - 2\text{Log } 5}{\text{Log } 5} \approx 0.43$

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

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

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

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

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

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

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