



Topic 9: Exponential and Logarithmic Equations

Questions 1 – 12 Solve the equation for x.

1. $5^x = 1$

2. $\frac{1}{8} = \left(\frac{1}{2}\right)^x$

3. $32^x = 2$

4. $7^{4x+1} = 7^3$

5. $10^4 = \frac{1}{10^x}$

6. $25 = x^2$

7. $x^3 = 27$

8. $10^{3x+7} = 1$

9. $8^{2x-1} = 64$

10. $5^{-3} = \frac{1}{5^{x-1}}$

11. $e^x = 6$ Express final answer as a simplified logarithmic expression.

12. $3^x = 4$ Express final answer as a simplified logarithmic expression.

Questions 13 – 20 Solve the equation for x.

13. $\log x = 6$

14. $\log_{1/5} x = -3$

15. $\log_2 16 = x$

16. $\log_x e^2 = 2$

17. $\log_x 10^9 = 9$

18. $\log_{1/4} 4^5 = x$

19. $\log_3 (x - 10) = 2$

20. $\log_8 (2x + 3) = \log_8 15$