Log Review

Write each equation in logarithmic form.

1. $2^7 = 128$

$\log_2 128 = 7$

2. $3^{-4} = \frac{1}{81}$

$\log_3 \frac{1}{81} = -4$

3. $\left(\frac{1}{7}\right)^3 = \frac{1}{343}$

$\log_{1/7} \frac{1}{343} = 3$

Write each equation in exponential form.

4. $\log_{15} 225 = 2$

$15^2 = 225$

5. $\log_3 \frac{1}{27} = -3$

$3^{-3} = \frac{1}{27}$

6. $\log_4 32 = \frac{5}{2}$

$4^{5/2} = 32$

Evaluate each expression.

7. $\log_4 64$

$\frac{\log 64}{\log 4} = 3$

8. $\log_2 64$

$\frac{\log 64}{\log 2} = 6$

9. $\log_5 625$

$\frac{\log 625}{\log 5} = 4$

10. $\log_{27} 81$

$\frac{\log 81}{\log 27} = \frac{4}{3}$

11. $\log_2 \frac{1}{128}$

$\frac{\log \frac{1}{128}}{\log 2} = -7$

12. $\log_{10} 0.00001$

$\frac{\log .00001}{\log 10} = -5$

Solve each equation or inequality. Check your solution.

13. $3^{2x-1} = 3^{x+2}$

$2x - 1 = x + 2$

$\boxed{X = 3}$

14. $2^{3x} = 4^{x+2}$ $2^{3x} = (2^2)^{x+2}$

$3x = 2x + 4$ $\boxed{X = 4}$

15. $3^{2x-1} = \frac{1}{9}$ $3^{2x-1} = 9^{-1}$

$2x - 1 = -2$ $\boxed{X = -\frac{1}{2}}$ $3^{2x-1} = 3^{-2}$

16. $4^{x+1} = 8^{2x+3}$

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

$2x + 2 = 6x + 9$

$-4x = 7$ $\boxed{X = -\frac{7}{4}}$

17. $8^{x-2} = \frac{1}{16}$

$(2^3)^{x-2} = 16^{-1}$ $(2^3)^{x-2} = 2^{-4}$

$3x - 6 = -4$

$3x = 2$ $\boxed{X = \frac{2}{3}}$

18. $25^{2x} = 125^{x+2}$

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

$4x = 3x + 6$ $\boxed{X = 6}$

Use a calculator to evaluate each expression to four decimal places.

19. $\log 18$

1.2553

20. $\log 39$

1.5911

21. $\log 120$

2.0792

22. $\log 5.8$

$.7634$

23. $\log 42.3$

1.6263

24. $\log 0.003$

-2.5229

Solve each equation or inequality. Round to four decimal places.

25. $4^{3x} = 12$

$3x \log 4 = \log 12$

$3x = 1.792$ $\boxed{X = .5975}$

26. $5^{4x-2} = 120$

$4x - 2 \log 5 = \log 120$

$4x - 2 = 2.975$ $\boxed{X = 1.2437}$

27. $2 \cdot 4^{x+4} = 30$

$x + 4 \log 2.4 = \log 30$ $\boxed{X = -.1150}$

28. $3 \cdot 6^{4x-1} = 85.4$

$4x - 1 \log 3.6 = \log 85.4$ $\boxed{X = 1.1180}$

29. $9^{3x} = 4^{5x+2}$

$3x \log 9 = 5x + 2 \log 4$

$3.1546 x + 1.2618$ $\boxed{X = -8.1617}$

Solve each equation

30. $\log_2 32 = 3x$ $\boxed{x = \dfrac{5}{3}}$

31. $\log_3 2c = -2$ $\boxed{c = \dfrac{1}{18}}$

32. $\log_{2x} 16 = -2$ $\boxed{x = \dfrac{1}{8}}$

33. $\log_{25}\left(\dfrac{x}{2}\right) = \dfrac{1}{2}$ $\boxed{x = 10}$

34. $\log_4 (5x + 1) = 2$ $\boxed{x = 3}$

35. $\log_8 (x - 5) = \dfrac{2}{3}$ $\boxed{x = 9}$

30) $\dfrac{\log 32}{\log 2} = 3x$

$3x = 5$

$\boxed{x = 5/3}$

31) $3^{-2} = 2c$

$\dfrac{1}{9} = 2c$

$c = \dfrac{1}{18}$

32) $(2x)^{-2} = 16$

$\dfrac{1}{4x^2} = 16$

$1 = 64x^2$

$\dfrac{1}{64} = x^2$

$\boxed{x = \dfrac{1}{8}}$

33) $25^{1/2} = \dfrac{x}{2}$

$5 = \dfrac{x}{2}$

$\boxed{x = 10}$

34) $4^2 = 5x + 1$

$16 = 5x + 1$

$15 = 5x$

$\boxed{x = 3}$

35) $8^{2/3} = x - 5$

$4 = x - 5$

$\boxed{x = 9}$