Algebra 2 – 8.2 D2 Evaluating Logs and Log Transformations WS

Name: _____ Hour: _____

Evaluate the following logarithmic expressions.

Ex 1: $\log_3 81 = 4$. This equals 4 because $3^4 = 81$. The idea is think "The base raised to what power gives you 81?"

Ex 2: $\log_2 \frac{1}{4} = -2$. This equals -2 because $(2)^{-2} = \frac{1}{4}$. The idea here is to think about how you can take the base (2) and get it to be $\frac{1}{4}$. You have to "flip" 2 (which is 2^{-1}), creating $\frac{1}{2}$, then square the $\frac{1}{2}$, giving you $\frac{1}{4}$. With fractions like this, think about negative powers. "If I flipped my base, what power would I need to use to get to my answer?"

1. $\log_3 27 =$
2. $\log_7 343 =$
3. $\log_9 81 =$
4. $\log_2 32 =$
5. $\log_{12} 1728 =$
6. $\log_8 512 =$
7. $\log_3 9 =$
8. $\log_2 8 =$
9. $\log_{15} 225 =$
10. $\log_{10} 10 =$
11. $\log 10 =$
12. $\log 1 =$
13. $\log_4 64 =$
14. $\ln 1 =$
15. $\log_8 4096 =$
16. $\log_5 625 =$
17. $\log_3 243 =$
18. $\log_{16} 256 =$
19. $\log_7 49 =$
20. $\log_{13} 2197 =$
21. $\log_{91} 1 =$
22. $\log_{15} 15 =$
23. $\log_6 36 =$
24. $\log_2 16 =$
25. $\log_3 729 =$
26. $\log_7 2401 =$
27. $\log_2 4 =$
28. $\log_{11} 121 =$
29. $\log_{10} 1000 =$
30. $\log_{\frac{1}{2}} 2 =$
31. $\log_3 \frac{1}{9} =$
32. $\log_2 \frac{1}{8} =$
33. $\log_{\frac{1}{6}} 36 =$
34. $\log_{\frac{1}{3}} 3 =$
35. $\log_4 \frac{1}{16} =$
36. $\log_5 \frac{1}{25} =$
37. $\log_{\frac{1}{7}} 49 =$
38. $\log_3 \frac{1}{27} =$
39. $\log_{\frac{1}{16}} 16 =$
40. $\log_{\frac{1}{2}} 16 =$
41. $\log_{\frac{1}{4}} 16 =$

42. $\log_4 \frac{1}{4} =$

43. $\log_{\frac{1}{9}} 81 =$

State the parent functions to the following equations. Then identify the transformations of the following equations from their parent functions.

Ex 1: $y = -3 * 2^{x-1} + 4$. Parent Function: $y = 2^x$. Negative sign – Reflects about X-Axis. The 3 vertically stretches graph by a factor of 3. The $x - 1$ moves the graph right 1. The $+4$ moves the graph up 4.

Ex 2: $y = -5\log_6(x + 2) - 3$. Parent: $y = \log_6 x$. The Negative sign – Reflects about X-Axis. The 5 vertically stretches by a factor of 5. The $x + 2$ moves graph left 2. The -3 moves graph down 3. (notice how it's basically the same)

44. $y = -3 * 2^{x+1}$ Parent: _____ Trans: _____

45. $y = 2\ln(x - 1)$ Parent: _____ Trans: _____

46. $y = -\log_5 x + 2$ Parent: _____ Trans: _____

47. $y = 4\log_2(x + 1)$ Parent: _____ Trans: _____

48. $y = \log_6(x - 3) + 2$ Parent: _____ Trans: _____

49. $y = \log_3 x + 8$ Parent: _____ Trans: _____

50. $y = -6^{x+5} - 1$ Parent: _____ Trans: _____

51. $y = -9\log_8(x + 9)$ Parent: _____ Trans: _____

52. $y = 11\ln x - 4$ Parent: _____ Trans: _____

53. $y = 3 * 9^x + 1$ Parent: _____ Trans: _____

54. $y = 14 * 6^{x+12} - 11$ Parent: _____ Trans: _____

55. $y = -elog_{16}(x - 3)$ Parent: _____ Trans: _____