Name:_____ Log and Exponent Review

Laws of Logs:

Rewrite the exponential equation as a log

1. $10^x = y$ **2.** $3^4 = 81$ **3.** $e^7 = x$ **4.** $e^x = 12$

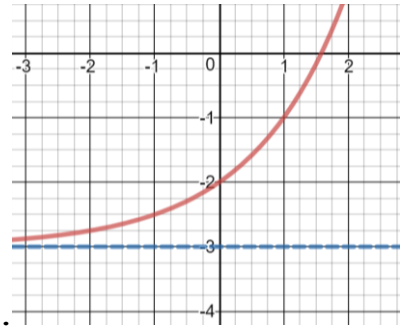
Use the laws of logarithms to expand the expression

5. $\log_2 (xy)^{10}$ **6.** $\log_a \left(\frac{x^2}{yz^3} \right)$ **7.** $\ln \sqrt[3]{3r^2 s}$ **8.** $\log_5 \sqrt{\frac{x-1}{x+1}}$

Use the laws of logarithms to combine the expression into a single log

9. $\log_5 \left(x^2 - 1\right) - \log_5 (x-1)$ **10.** $\ln(a+b) + \ln(a-b) - 2\ln c$ **11.** $2(\log_5 x + 2\log_5 y - 3\log_5 z)$

Exponent and Log Graphs: Match the graph with the equation



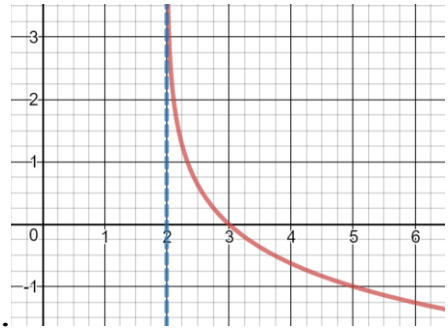
1.

A. $f(x) = 2^x - 3$

B. $f(x) = 2^{x-3}$

C. $f(x) = -2^x - 3$

D. $f(x) = 2^{-x} - 3$



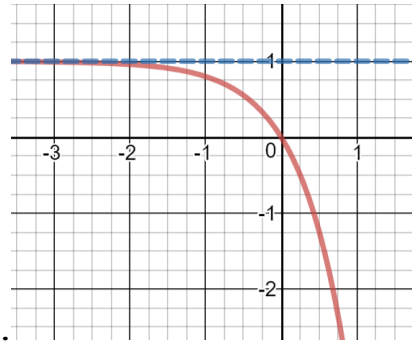
2.

A. $f(x) = \log_3 (x+2)$

B. $f(x) = \log_3 (x-2)$

C. $f(x) = -\log_3 (x-2)$

D. $f(x) = -\log_3 (x+2)$



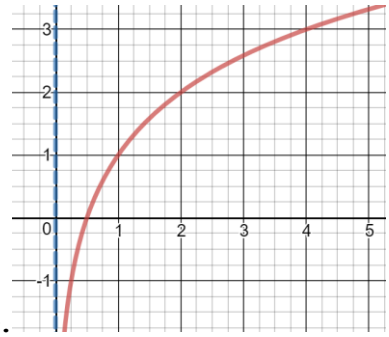
3.

A. $f(x) = 5^x + 1$

B. $f(x) = -5^x + 1$

C. $f(x) = \log_5 x + 1$

D. $f(x) = -\log_5 x + 1$



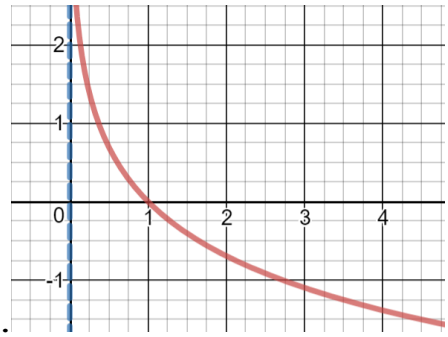
4.

A. $f(x) = -\log_2 x + 1$

B. $f(x) = \log_2 x + 1$

C. $f(x) = -2^x + 1$

D. $f(x) = 2^{x+1}$



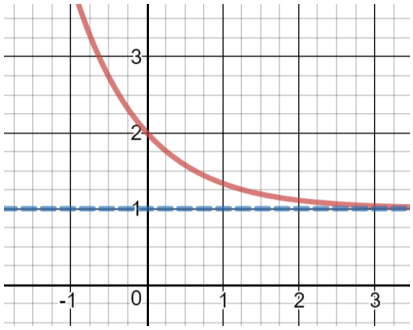
5.

A. $f(x) = -\ln x$

B. $f(x) = \ln(-x)$

C. $f(x) = e^{-x}$

D. $f(x) = e^x$



6.

A. $f(x) = 3^x + 1$

B. $f(x) = -3^x + 1$

C. $f(x) = -3^{x+1}$

D. $f(x) = 3^{-x} + 1$

Find the domain of the function in interval notation

7. $f(x) = \log_5(8 - 2x)$

8 $f(x) = \ln(3x + 1)$

Word Problems: This is the calculator part. Work the word problems from last week that you haven't done already

Solving Log Equations/Exponent Rules:

1. $\left(\frac{16}{81}\right)^{-3/4}$

2. $4^{x+2} = 16^{2x+7}$

3. $\log_4 x = -\frac{1}{2}$

4. $\log_x 8 = -3$

5. $\log_x 64 = 3$

6. $\log_2 x = -2$

7. $\log_{16} x = \frac{3}{4}$

8. $\log_x 3 = \frac{1}{3}$

9. $\log_{400} 1$

10. $\log 1{,}000$

11. $\ln e^4$

12. $\left(\sqrt{2}\right)^{10}$

13. $\log_{16} 32$

14. $\log_2(3x - 4) = 3$

15. $\log\left(x^2 + 3x\right) = 1$

16. $\log x = \frac{1}{2}\log 81 - \frac{1}{3}\log 27$

17. $\log_5 2x = 3\log_5 2 - \log_5 12$

18. $\log_3 x + \log_3(x - 8) = 2$

Solve each equation. Leave your answer in terms of log, ln or e

19. $6^x = 7$

20. $3^{2x-1} = 5$

21. $2^{2x-1} = 7^{x+3}$

22. $4e^{2x-3} - 2 = 14$

23. $4\ln(x - 3) + 2 = 22$