

Review for Logs Test

Name: _____

Due: Fri May 20, Mon May 23

SECTION 1: Expand/condense.

1. $\log_3 \left(\frac{x^5}{2y^6} \right)$	2. $\log_5 (x^3 \sqrt{y})^4$
3. $\log (x^4 \sqrt{x^3 - 4})$	4. $\ln \sqrt[5]{ea}$
5. $\log \left(\frac{2x\sqrt[3]{x^2+3}}{x-1} \right)$	6. $\ln \left(\frac{x^2}{7e^x} \right)$

Condense the logs.

7. $4\log_b x - \log_b y + 3\log_b c$	8. $\log_2(x+1) - \log_2(x^2-1)$
9. $\log_2 \left(\frac{1}{x} \right) + \log_2 \left(\frac{1}{x^2} \right)$	10. $12\log_3 \sqrt[3]{x} + \log_3(16x^2) - \log_3 2$
11. $\ln \left(\frac{x^2 - 3x - 4}{x - 3} \right) - \ln \left(\frac{x^2 - 2x - 3}{x + 9} \right) + \ln(x^2 - 8x + 16)$	12. $\log \left(\frac{x^2 - 2x - 3}{x^2 - 4} \right) - \log \left(\frac{x^2 + 7x + 6}{x + 2} \right)$

SECTION 2: SOLVE THE EQUATIONS (check for extraneous!)

1. $5^x = 10$

2. $10e^{x-4} = 6$

3. $8^{1-5x} = \frac{1}{4}$

4. $4e^{3x} = 20$

5. $3^{2x} = 81\sqrt{3}$

6. $3^{x^2+x} = \sqrt{3}$

7. $\left(\frac{4}{25}\right)^{x+1} = \frac{8}{125}$

8. $2^{x^2-3} = 64$

9. $2\log_3 x = 4$

10. $\log_4(3x+2) = -1$

11. $\log_{15}(x^2 - 2x) = 1$

12. $2 + \log_3(2x+5) - \log_3 x = 4$

13. $\log(x-3) = \log(2x+7)$

14. $\log_4(x^2 - 9) - \log_4(x+3) = 3$

15. $\ln x + \ln(2) = 4$

16. $\log_3 x = \log_9(x - 2)$

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

18. $2^x = 5^{1-2x}$

SECTION 3: CONVERT, EVALUATE, SIMPLIFY

Convert.

1. $\log_2 5 = x$	2. $\ln x = 8$
3. $10^2 = 100$	4. $e^{15} = x$

Evaluate/simplify.

5. $\log_2 32$	6. $\log_{25} 5$
7. $\log 10$	8. $\log 1$
9. $\ln e$	10. $e^{\ln 10}$
11. $\ln e^3$	12. $16^{\log_2(5x)}$

Change the base.

13. Change to base 10: $\log_2 7$	14. Change to base e: $\log_5 21$
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Simplify.

15. $\frac{(2e^2)^3}{16e^5}$

16. $(3e)^2 \cdot e^{-7}$

17. $\ln(e^{4x})$

18. $2e^{\ln(5)}$

Find the inverse of the function.

19. $h(x) = -\frac{1}{3} \log_2(x + 3)$

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

21. $y = \ln(x + 2) - 6$

22. $y = 3^{x+1} + 5$

SECTION 4: GRAPH AND STATE THE DOMAIN AND RANGE!!

1. $y = (4)^{x-1} + 7$
2. $y = -2(3)^{x+5} - 2$
3. $y = \log(x+1) - 3$
4. $y = 2 \log(x-4) + 6$

Domain: _____

Asymptote: _____

Range: _____

Asymptote: _____

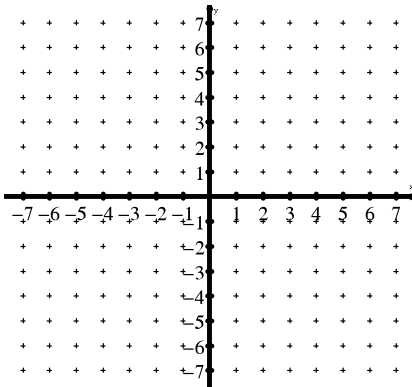
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Asymptote: _____

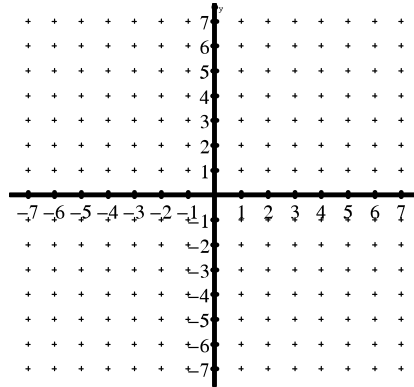
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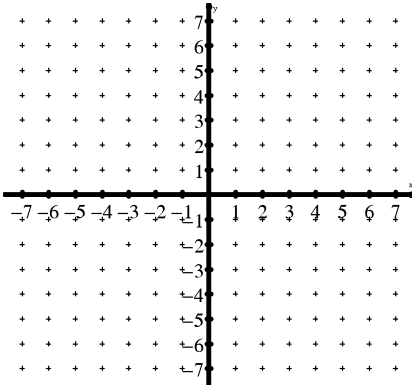
5. $f(x) = 3^{x-2} + 1$



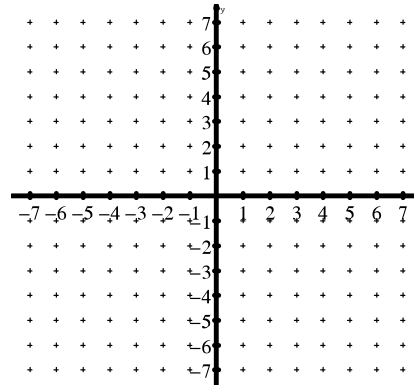
8. $h(x) = 4\left(\frac{1}{2}\right)^{x+3} - 2$



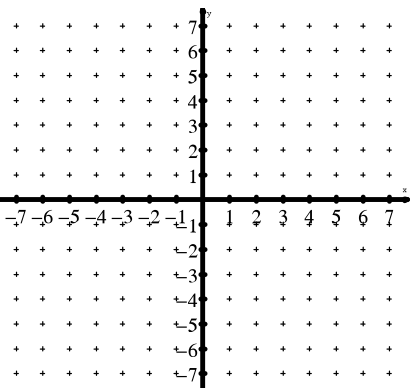
6. $f(x) = -\log_7 x - 5$



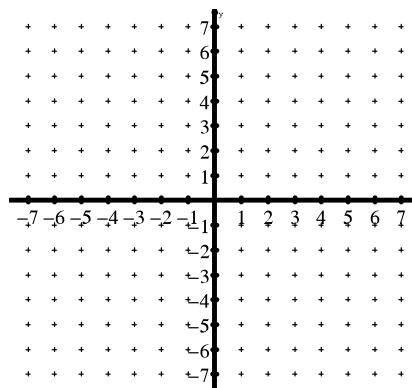
9. $y = 4 \log_3(x+2) - 3$



7. $g(x) = -2(2)^x + 4$



10. $y = -2 \log_5(x-2) - 1$



SECTION 5: MODELING

You deposit \$3,000 into a savings account that yields 3.5% annual interest.

1. How much will you have in your account after 10 years if interest is compounded weekly?	2. How much will you have in your account after 10 years if interest is compounded continually?
3. When will you have \$3,200 if interest is compounded once a year?	4. When will you have \$3,200 if interest is compounded continually?

5. The half – life of Iodine – 131 is 10 days. How long will it take for a sample of 300 ounces to decay to the size of 45 ounces?
6. The half – life of Iodine – 131 is 10 days. If there is an initial sample of 125mg of Iodine – 131, how much Iodine – 131 will be left after 52 days?
7. The population in the state of Virginia in 1995 was 6.6 million people. In 2005, the population grew to 7.5 million people. Find the equation that models this growth and use it to estimate the population of Virginia in 2011.