Accelerated Geometry CC
Logarithm Test Review

Name KEY
Date: _____ **Period:** _____

1. Evaluate $5^{\log_5 3} + \log_9 9^{-3}$.

$3 + -3$

0

2. Simplify $-2\ln e^7$.

$-2(7)$

-14

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3 Simplify $4e^{\ln 3} - \ln e^5$.

$4(3) - 5 = 12 - 5 = 7$

Given $\log_5 2 = 0.4307$, $\log_5 4 = 0.8614$ and $\log_5 7 = 1.2091$.

4. $\log_5 14$

$= \log_5(7 \cdot 2)$

$= \log_5 7 + \log_7 2$

1.6398

5. $\log_5 \frac{4}{5}$

$= \log_5 4 - \log_5 5$

-0.1386

6. $\log_5 70$

$= \log_5(5 \cdot 14)$

$= \log_5 5 + \log_5(7 \cdot 2) = 1 + \log_5 7 + \log_5 2$

2.6398

Evaluate.

7. $\log_2 16 = x$

exp. $\rightarrow 2^x = 16$

$x = 4$

8. $\log_3 \frac{1}{27} = x$

exp. $\rightarrow 3^x = 1/27$

$x = -3$

9. $\log_9 3 = x$

exp. $\rightarrow 9^x = 3$

$x = 1/2$

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10. Given $\log_b 3 = 0.5283$ and $\log_b 7 = 0.9358$. Find $\log_b 21b$.

$= \log_b(3 \cdot 7 \cdot b) = \log_b 3 + \log_b 7 + \log_b b = 2.4641$

Solve.

11. $7 - 2^x = 1$

$-2^x = -6$

$2^x = 6 \xrightarrow{\log} \log_2 6 = x$

$= \log 6 / \log 2 = x \quad 2.585 = x$

12. $10^x = 1456$

log $\rightarrow \log_{10} 1456 = x$

$3.163 = x$

13. $e^{2x-1} = 9$

log $\rightarrow \ln 9 = 2x - 1$

$\ln(9) + 1 = 2x \rightarrow \frac{\ln(9)+1}{2} = x$

$1.599 = x$

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14. $3 + \log 5x = 10$.

$\log 5x = 7$

exp. $\rightarrow 10^7 = 5x$

$2{,}000{,}000 = x$

15. $6 = \log_x 64$

exp. $\rightarrow 64 = x^6$

$2 = x$

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16. $2\log_b x = \log_b(x-1) + \log_b 4$

$\log_b x^2 = \log_b(4x - 4)$

$x^2 = 4x - 4$

$x^2 - 4x + 4 = 0 \rightarrow (x-2)(x-2) = 0$

$x = 2$

17. $3\ln x + 3 = 1$

$3\ln x = -2$

$\ln x = -2/3$

exp. $\rightarrow e^{-2/3} = x$

$0.513 = x$

18. $2\ln 3 + \ln(x+1) + \ln 2 = \ln 4 - \ln 2 + \ln x$

$\ln(18x+18) = \ln(2x)$

$18x+18 = 2x$

$16x = -18$

$x = -9/8 \rightarrow$ No Solution!

19. $5^{x+1} = 2^x$

$(x+1)\log 5 = x \log 2$

$.6989x + .69897 = .30103x$

$.69897 = -.39794x$

$-1.756 = x$

20. $\log_5 134 = x \longrightarrow 5^x = 134$ No clue!

$\frac{\log 134}{\log 5} = 3.043$

21. $\log_2 87 = x \longrightarrow 2^x = 87$ No clue

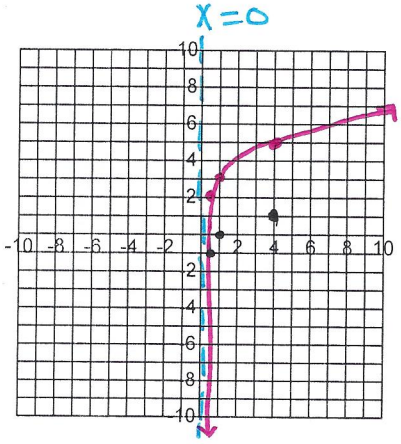
$\frac{\log 87}{\log 2} = 6.443$

26. Graph $y = \log_4 x + 3$ ← up 3

$x = 0$

Domain: $x > 0$

Range: $\mathbb{R}$



$y = \log_4 x$

$\downarrow$

$x = 4^y$

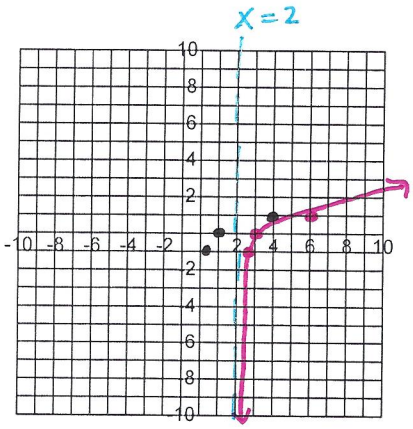
x	y
1/4	-1
1	0
4	1

27. Graph $y = \log_4(x-2)$ ← right 2

$x = 2$

Domain: $x > 2$

Range: $\mathbb{R}$



$y = \log_4 x$

$\downarrow$

$x = 4^y$

x	y
1/4	-1
1	0
4	1

28. Find the Inverse

a. $y = \ln(x-4)$

exp. $x = \ln(y-4)$

$y - 4 = e^x$

$y = e^x + 4$

b. $y = 4^{x-5}$

log $x = 4^{y-5}$

$y - 5 = \log_4 x$

$y = \log_4 x + 5$

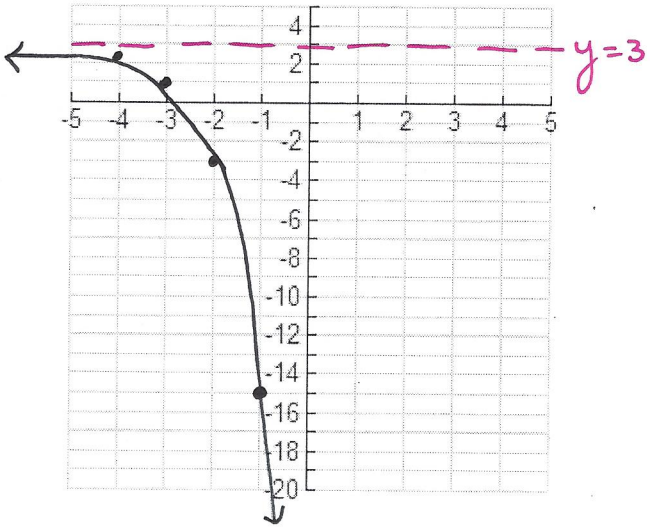
You also need to be able to expand and/or condense a logarithm

Accelerated Geometry CC
Exponential Review

Name: _____
Date: _____ Period: ____

Graph the function. State whether the function represents exponential growth or exponential decay. Identify the asymptote, domain, range, end behavior, and any transformations:

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

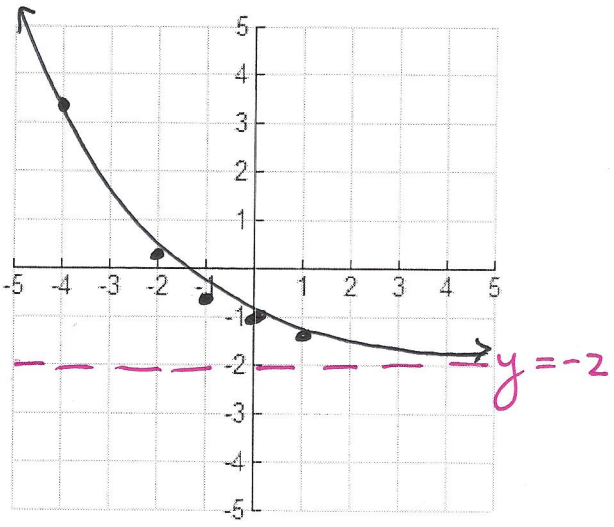


Growth/Decay: Growth

Asymptote: $y = 3$

Domain: $\mathbb{R}$ Range: $y < -3$

2. $f(x) = \left(\frac{3}{2}\right)^x - 2$

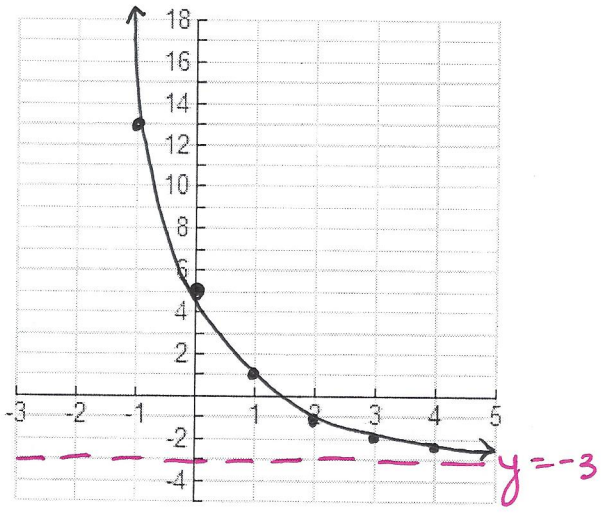


Growth/Decay: Growth

Asymptote: $y = -2$

Domain: $\mathbb{R}$ Range: $y > -2$

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

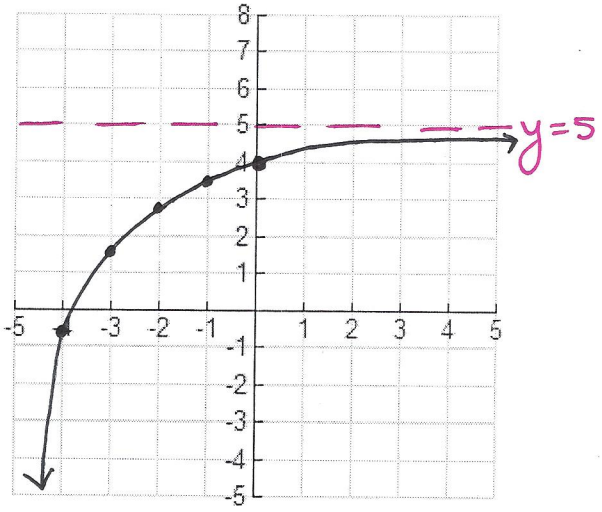


Growth/Decay: Decay

Asymptote: $y = -3$

Domain: $\mathbb{R}$ Range: $y > -3$

4. $f(x) = -\left(\frac{2}{3}\right)^x + 5$



Growth/Decay: Decay

Asymptote: $y = 5$

Domain: $\mathbb{R}$ Range: $y < 5$

Accelerated Geometry CC
Exponential Review

Name: _____
Date: _____ Period: ____

$A(t) = P(1 \pm r)^t$

5. You deposit $10,000 in your account that pays 3.5% interest. Write an exponential growth model giving the final amount *A* (in dollars) after *t* years. What is the amount you will have after 5 years.

$A = 10{,}000(1+0.035)^t$

$\downarrow$

$A = 10{,}000(1.035)^5$

$A = \$11{,}876.86$

6. You buy a new computer and accessories for $1200. The value of the computer decreases by 30% each year. Write an exponential decay model giving the computer's vale *V* (in dollars) after *t* years. What is the value of the computer after 4 years?

$V = 1200(1-.30)^t$

$\downarrow$

$V = 1200(0.70)^4$

$V = \$288.12$

7. Graph the function. Identify the domain and range. Then find the inverse function and graph. Also, identify the domain and range for the inverse function.

$f(x) = -\sqrt{x} + 2$ $\longrightarrow$ $x = -\sqrt{y} + 2$

x	y
0	2
1	1
4	0
9	-1
16	-2

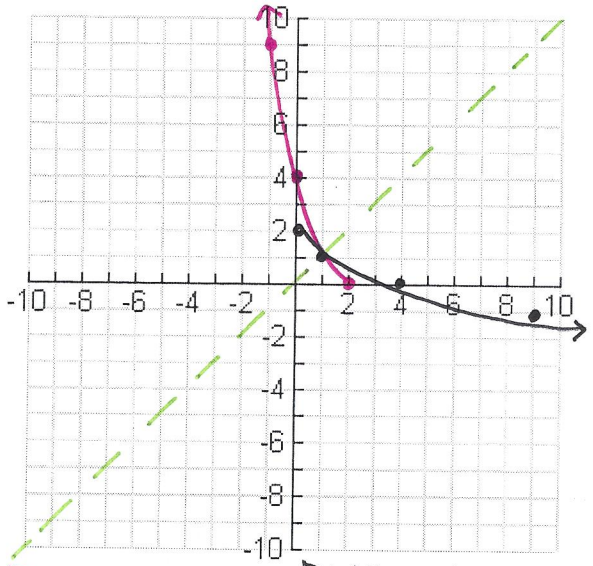
Inverse

$x - 2 = -\sqrt{y}$

$-x + 2 = \sqrt{y}$

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

$f(x)^{-1} = (-x+2)^2;\ x \le 2$



D: $x \le 2$
R: $y \ge 0$

D: $x \ge 0$ R: $y \le 2$