Algebra 2 Name_____

Alg 2 - Properties of Logarithms (8-4) HW

Date_____ Period____

Evaluate each expression.

1) $\log_2 8$

2) $\log_3 81$

Rewrite each equation in exponential form.

3) $\log_{12} 144 = 2$

4) $\log_{16} 256 = 2$

5) $\log_x 100 = y$

Rewrite each equation in logarithmic form.

6) $2^{-6} = \frac{1}{64}$

7) $27^{\frac{1}{3}} = 3$

8) $x^y = 80$

Expand each logarithm.

9) $\ln (8^5 \cdot 11)^6$

10) $\log_5 (11^3 \cdot 10^5)$

11) $\log \left(\frac{11}{6^6}\right)^5$

12) $\log_7 (x^5 y^5)$

13) $\log_6 (z\sqrt{x \cdot y})$

Condense each expression to a single logarithm.

14) $6\log_2 3 + 6\log_2 7$

15) $2\log_3 12 - 4\log_3 5$

16) $4\log_4 7 + 5\log_4 3$

17) $4\log_7 u + 3\log_7 v$

18) $6\log_6 u - 2\log_6 v$

Solve each system.

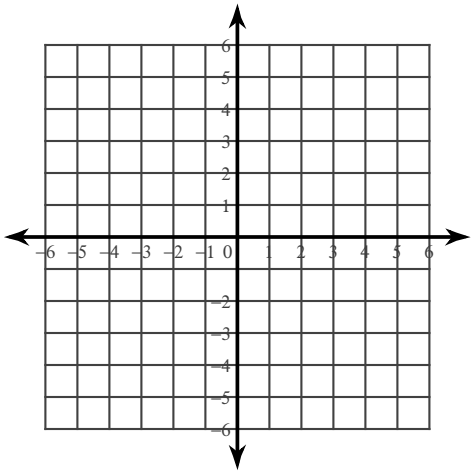
19) $-9x - 12y = 18$
$2x + 4y = -16$

20) $10 = 2y + 9x$
$-3y = -15 + 10x$

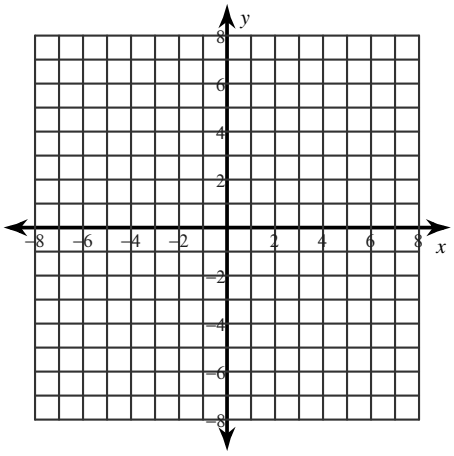
21) $-4a + 2c = 24$
$a + b - 6c = -9$
$3a - 6b + 5c = 0$

Graph each equation (Hint: Make a t-chart).

22) $y = \left|x + 4\right| - 2$

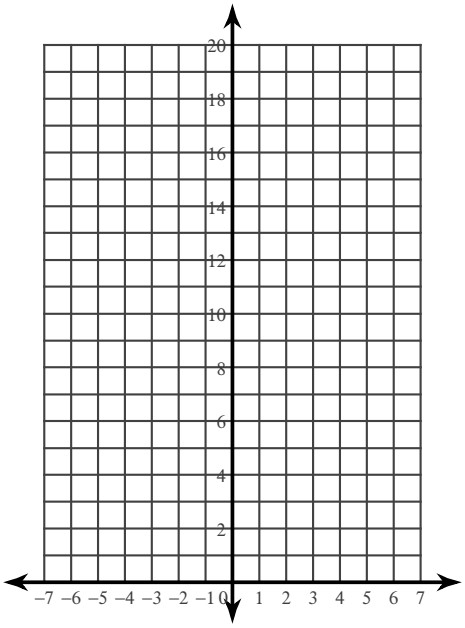


23) $y = x^2 - 6x + 6$

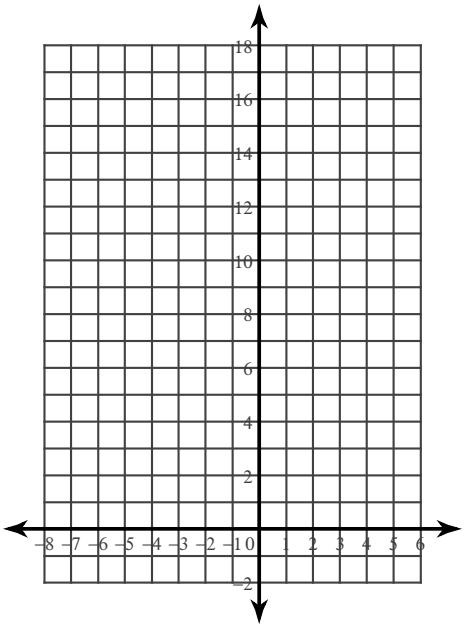


Sketch the graph of each function.

24) $y = \frac{1}{3} \cdot \left(\frac{1}{3}\right)^x$



25) $y = 4 \cdot 2^{x+1} - 2$



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$12^2 = 144$

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$16^2 = 256$

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$x^y = 100$

Rewrite each equation in logarithmic form.

6) $2^{-6} = \frac{1}{64}$ $\log_2 \frac{1}{64} = -6$

7) $27^{\frac{1}{3}} = 3$ $\log_{27} 3 = \frac{1}{3}$

8) $x^y = 80$

$\log_x 80 = y$

Expand each logarithm.

9) $\ln (8^5 \cdot 11)^6$

$30 \ln 8 + 6 \ln 11$

10) $\log_5 (11^3 \cdot 10^5)$

$3 \log_5 11 + 5 \log_5 10$

11) $\log \left(\frac{11}{6^6}\right)^5$

$5 \log 11 - 30 \log 6$

12) $\log_7 (x^5 y^5)$

$5 \log_7 x + 5 \log_7 y$

13) $\log_6 (z\sqrt{x \cdot y})$

$\log_6 z + \frac{\log_6 x}{2} + \frac{\log_6 y}{2}$

Condense each expression to a single logarithm.

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$\log_7 (v^3 u^4)$

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$\log_6 \frac{u^6}{v^2}$

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$(10, -9)$

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$(-6, -3, 0)$

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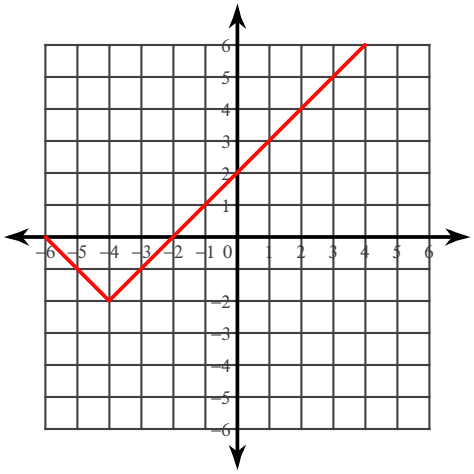

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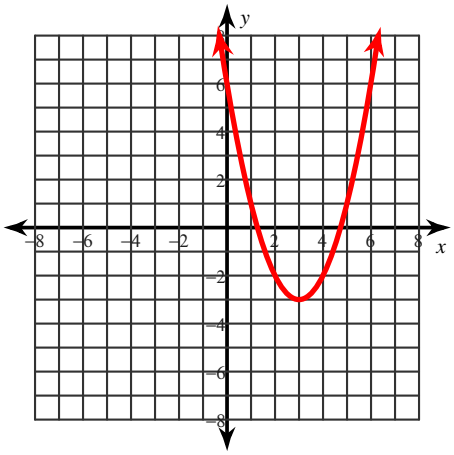

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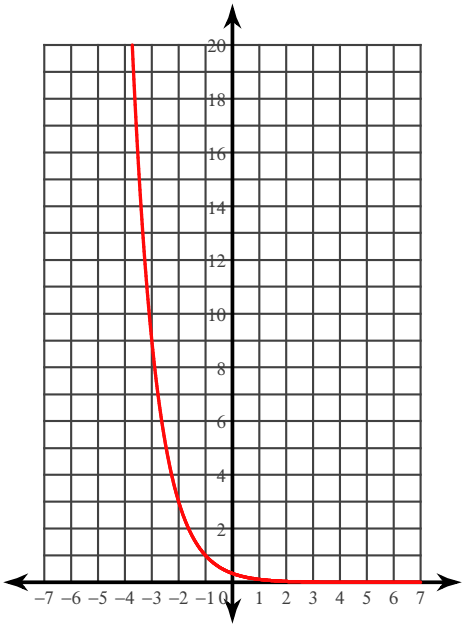

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