

Unit 5 Study Guide

Date _____ Period _____

SOLVING EXPONENTIAL EQUATIONS WITH THE SAME BASE.**Directions: Solve each equation by writing both sides with the same base then using the one-to-one property.**

1) $5^{3v} = 125$

2) $16^{-2a-1} = 4$

3) $16^x = 64$

4) $216^{-n+3} = \frac{1}{6}$

SOLVING EXPONENTIAL EQUATIONS WITHOUT THE SAME BASE.**Directions: Use logarithms to solve each equation. Round your answers to three decimal places.**

5) $-8 \cdot 3^{x-5} + 9 = -23$

6) $-10 \cdot 3^{3n} + 8 = -22$

7) $8 \cdot 13^{x+7} + 5 = 93$

8) $2 \cdot 5^{x-2} - 10 = 76$

Use this for questions 10-17.

9) $\log_b a = x$ is equivalent to $b^x = a$

LOGARITHMIC FORM TO EXPONENTIAL FORM.**Directions: Rewrite each equation in exponential form.**

10) $\log_2 b = 13$

11) $\log_{\frac{9}{5}} x = y$

12) $\log_{81} 9 = \frac{1}{2}$

13) $\log_x 188 = y$

EXPONENTIAL FORM TO LOGARITHMIC FORM.**Directions: Rewrite each equation in logarithmic form.**

14) $m^{-10} = 144$

15) $18^x = 18$

16) $11^y = x$

17) $v^{14} = 166$

EVALUATE A LOGARITHM.

Directions: Evaluate each expression. "Think what exponent of the base will give me the argument."

18) $\log_2 16$

19) $\log_2 32$

20) $\log_6 \frac{1}{216}$

21) $\log_5 5$

PROPERTIES OF LOGARITHMS.

Directions: Expand each logarithmic expression to sum or difference.

22) $\log_2 (12^4 \cdot 11^3)$

23) $\log_4 \frac{u^6}{v^2}$

Directions: Condense each expression to a single logarithm.

24) $25 \log_8 a + 5 \log_8 b$

25) $2 \log_9 8 - 2 \log_9 3$

LOGARITHMIC EQUATIONS

Directions: Solve each equation. Remember to use the appropriate steps for the type and check for extraneous solutions.

26) $\log_7 (5m - 7) = \log_7 (3m + 3)$

27) $\log_8 (-x + 4) = \log_8 -5x$

28) $\log_9 (x - 6) + \log_9 10 = 2$

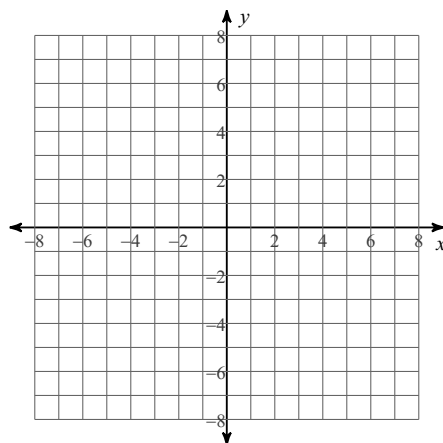
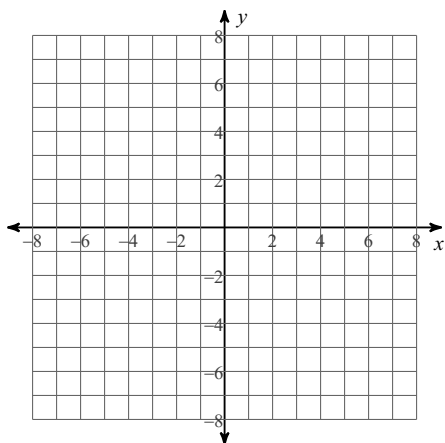
29) $\log_3 2x - \log_3 4 = 4$

GRAPHING LOGARITHMIC EQUATIONS

Directions: Identify the domain and range of each. State the equation of the asymptote. Then sketch the graph.

30) $y = \log_3 (4x + 1) - 5$

31) $y = \log_4 (3x - 7) - 2$



Answers to Unit 5 Study Guide

1) $\{1\}$

2) $\left\{-\frac{3}{4}\right\}$

3) $\left\{\frac{3}{2}\right\}$

4) $\left\{\frac{10}{3}\right\}$

5) 6.2619

6) 0.3333

7) -6.0651

8) 4.337

9)

10) $2^{13} = b$

11) $\left(\frac{9}{5}\right)^y = x$

12) $81^{\frac{1}{2}} = 9$

13) $x^y = 188$

14) $\log_m 144 = -10$

15) $\log_{18} 18 = x$

16) $\log_{11} x = y$

17) $\log_v 166 = 14$

18) 4

19) 5

20) -3

21) 1

22) $4\log_2 12 + 3\log_2 11$

23) $6\log_4 u - 2\log_4 v$

24) $\log_8 (b^5 a^{25})$

25) $\log_9 \frac{8^2}{3^2}$

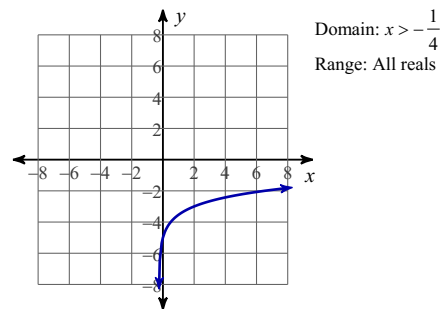
26) $\{5\}$

27) $\{-1\}$

28) $\left\{\frac{141}{10}\right\}$

29) $\{162\}$

30)



31)

