Name: _____ Period: _____

Algebra 2

Chapter 7: Exponential and Logarithmic Functions and Relations

Targets	Learning Targets	Got it	Ok	No way
T7-1	I can describe transformations, graph and determine domain and range of exponential and logarithmic functions.	☐	☐	☐
T7-2	I can use the properties of exponents to write and solve equations and interpret real world scenarios.	☐	☐	☐
T7-3	I can use the properties of logarithms to write and solve equations and interpret real world scenarios.	☐	☐	☐

Date	Lesson/Activity	Homework Assignment o = only do odd problems	Turned In?
T7-1	7.1 Graphing Exponential Equations 7.1 Note guide	7.1 pg 456 #9-25o, 12, 26, 27 **For #9-25o In addition to the books instructions:** State the parent function and all transformations.	
T7-2	7.2 Solving Exponential Equations	7.2 Pg 464 #9-23, 33-37o	
T7-1 T7-2	7.1 & 7.2 Review	7.1 & 7.2 Worksheet	
T7-1	7.3 Logarithms & Logarithmic Functions	7.3 Pg472 #13-35o, 37-47o, 50 **For 37-47o In addition to the books instructions:** State the parent function and all transformations.	
T7-3	7.4 Solving Logarithmic Equations	7.4 WS All	
T7-3	7.5 Properties of Logarithms Properties of Logs WS	7.5 Pg488 #23-26, 36-49, 51-57o	
T7-2 T7-3	7.8 Application of exponential and logarithmic functions	7.8 WS All	
All	ART/REVIEW	TBD	
All	Ch 7 Exam	All homework must be turned in before the test to be eligible for retakes.	

Ch 6 Retake Problems

Targets	Learning Targets	
T6-4	I can simplify radical expressions by multiplying and dividing.	RETAKE WS
T6-5	I can simplify radical expressions by adding and subtracting.	RETAKE WS
T6-6	I can solve equations containing radicals and verify the solution.	RETAKE WS

Your spaceship has crashed on an unknown planet. You and your crew encounter a drooling, carnivorous alien monster. As you can guess, this is not good. It gets worse. While you are cowering in a cave, trying not to cry "mommy" in front of your crew, your science officer is able to chart the monster's growth over several hours time. She comes back to you with her report (and minus one arm). The news is grim... With each hour that passes, the monster doubles in size (specifically, his height.) (She also said that the monster's stomach was making those growly-hungry noises.)

If we assume that the monster is 1 foot tall at birth, what formula would describe the growth of the monster?

Time (t) in hours	Height in feet

For some reason your science officer starts yelling crazy things at you (while waving her one arm all around) and quits. In desperation, you promote the crew cook, Stu, and send him out of the cave to do more exploring. Unfortunately, he finds a second species of drooling alien monster... Fortunately for Stu, it's and herbivore! Unfortunately for Stu, your uniforms are green. Days later, one of Stu's socks and a clip board of growth data for the monster is found.

The second species is **4 inches tall at birth**. Copy the data from Stu's clipboard below:

Time (t) in hours	Height in inches

Conclusion:

Formula for its growth:

How tall will this one be after 2.5 hours?
How tall will this one be after 4.2 hours?

You are sent out of the cave next.... You find a third species of alien monster. It is not drooling, but it does have a serious breath problem. You find that this species is 2cm tall at birth and gets five times as tall with each day that passes.

Create a table of data, and a formula to describe the monsters growth.

Time (t) in _____	Height in _____

Formula for growth:

How tall will the monster be after 3.7 days?

How tall will the monster be after 10 days?

This concept works the same with decay.

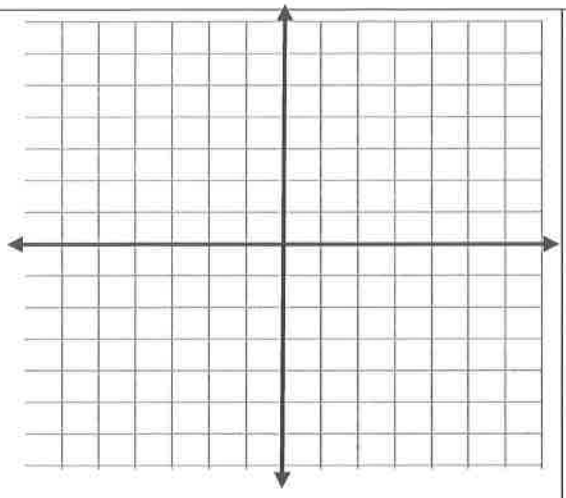
You are sent out of the cave...again...you find a fourth species of alien monster. This one is kind of cute except for the fact that if you look at it in the eyes, you shrink by 12% every second you lock orbits. You originally stand at 175 cm. Create a formula that models your height, h, with respect to time, t.

If you are shrinking by 12% every second, how much of you is left every second?
Don't forget, percents can't be entered into calculators so you always convert them to decimals!

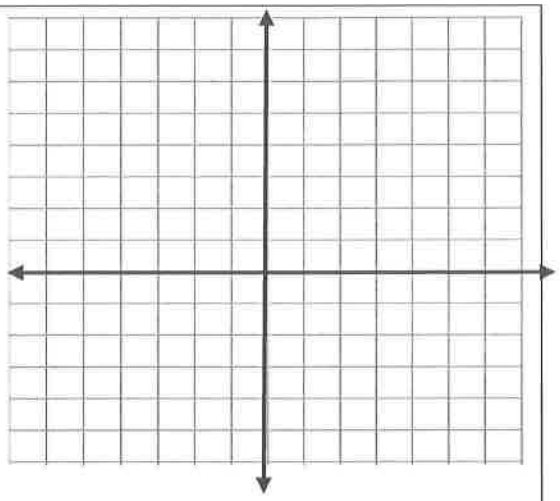
Time (t) in _____	Height in _____

Formula:
How tall will you be after 3 seconds of orbit lock?
How tall will you be after 6 seconds of orbit lock?

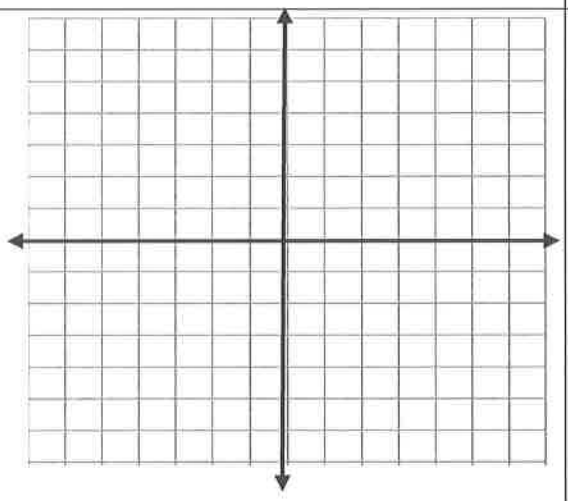
Example 1./5.



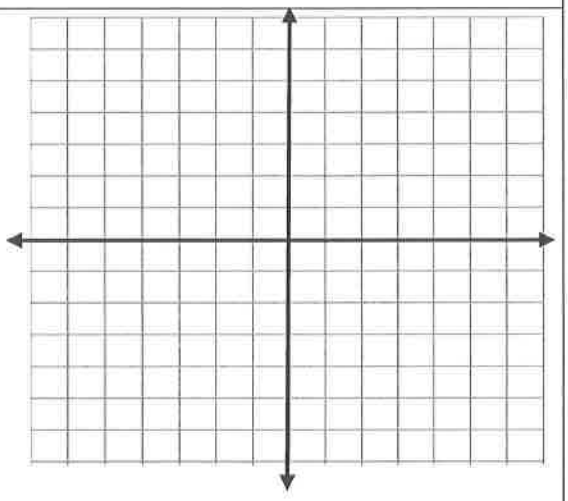
Example 2.



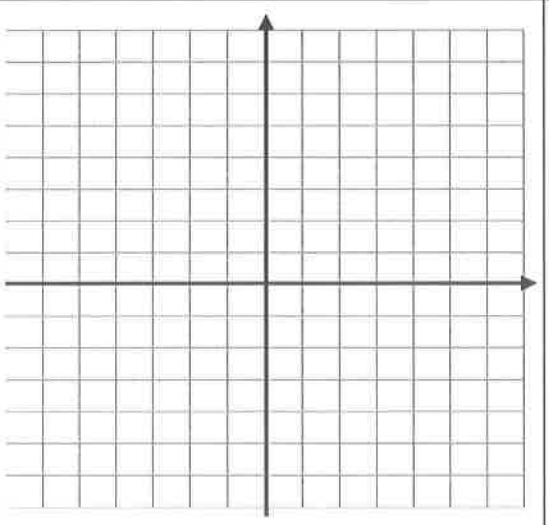
You Try 3.



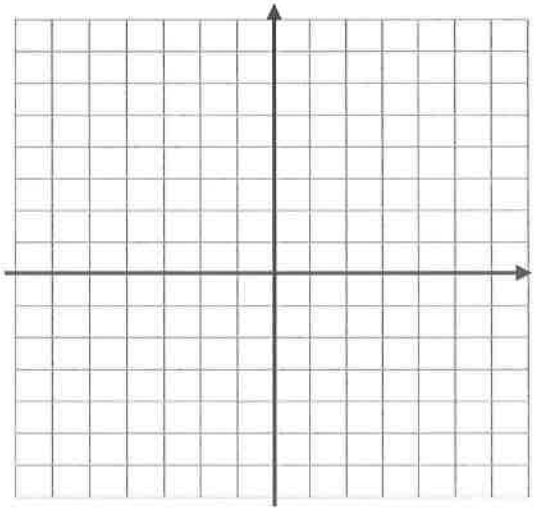
You Try 4.



Example 6.



HW 9.



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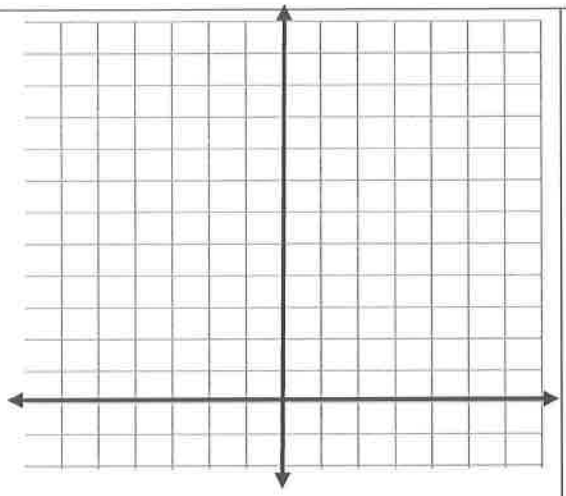

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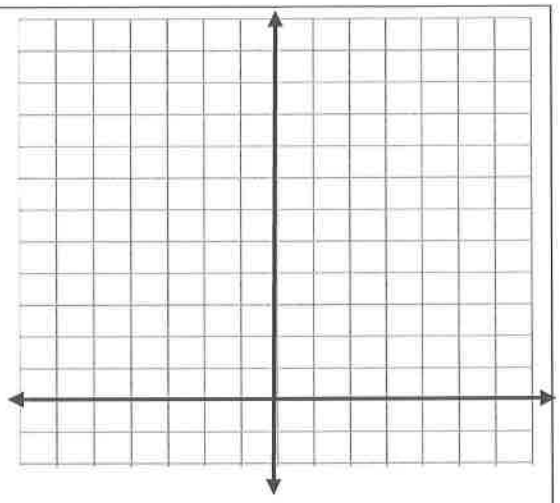

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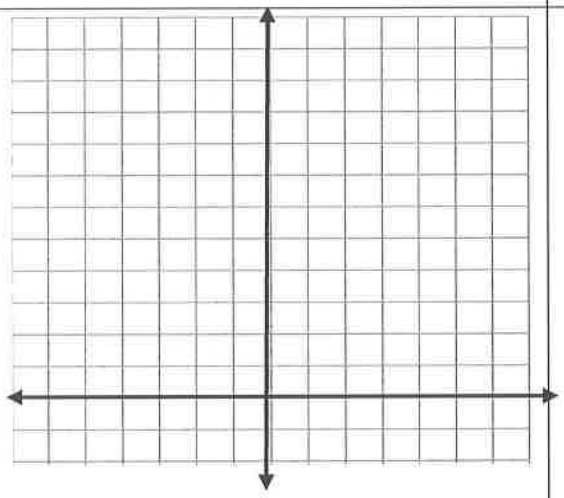

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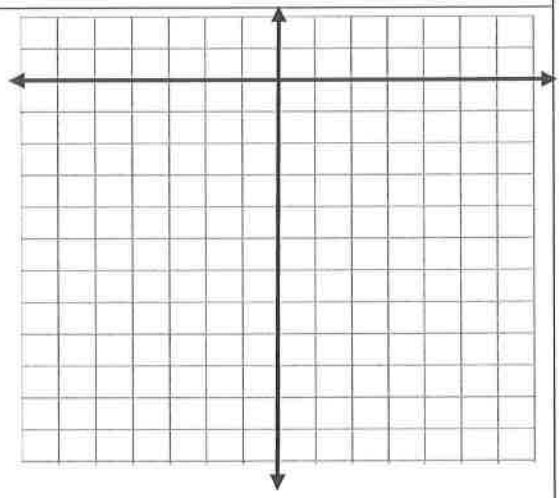

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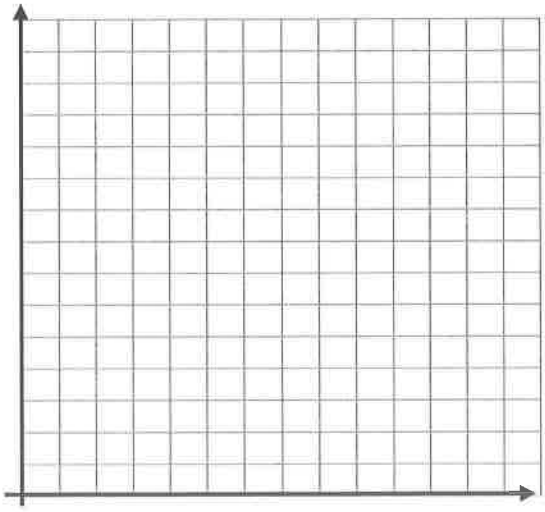
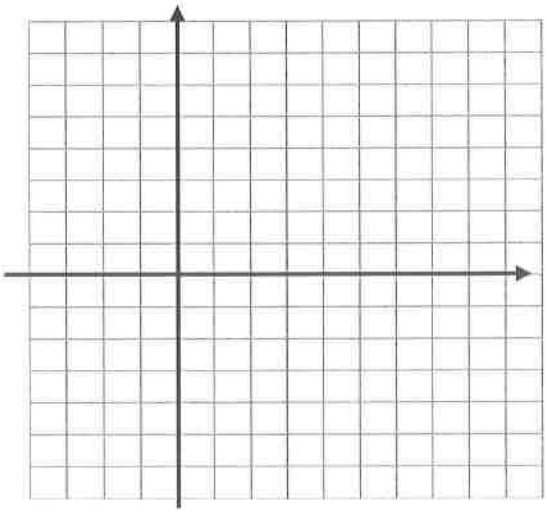


Number of Weeks

HW 21.



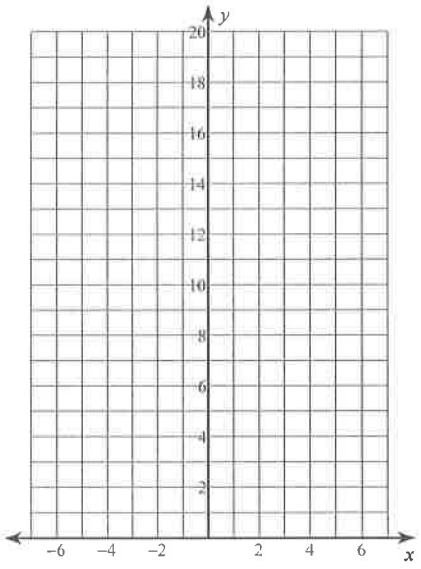
Kuta Software - Infinite Algebra 2 T7-1/Day3 Name_____

Graphing Exponential Functions

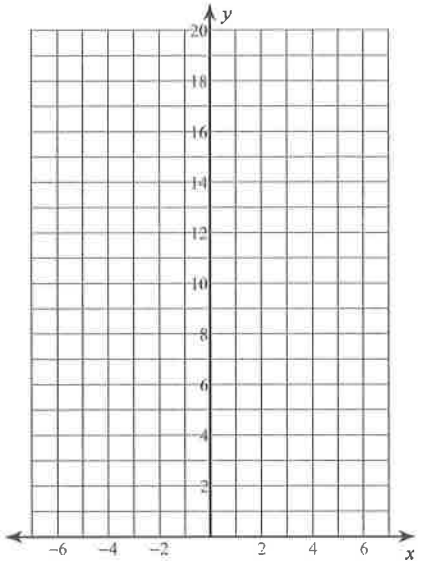
Date_____ Period____

Sketch the graph of each function.

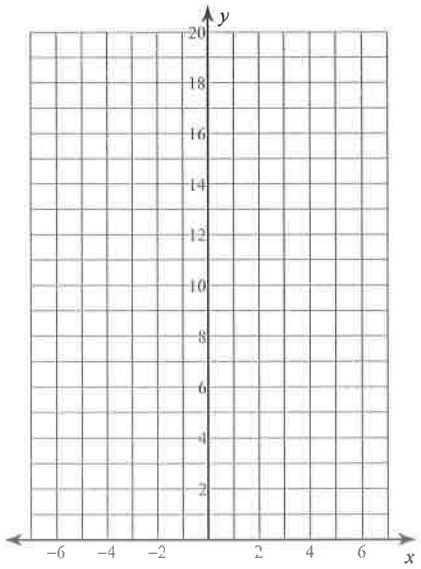
1) $y = 4 \cdot 2^x$



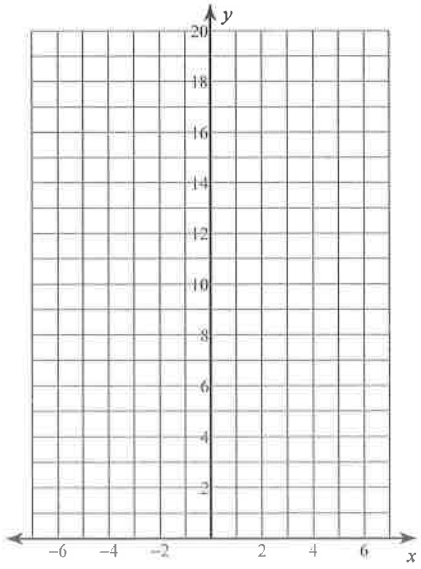
2) $y = 5 \cdot 2^x$



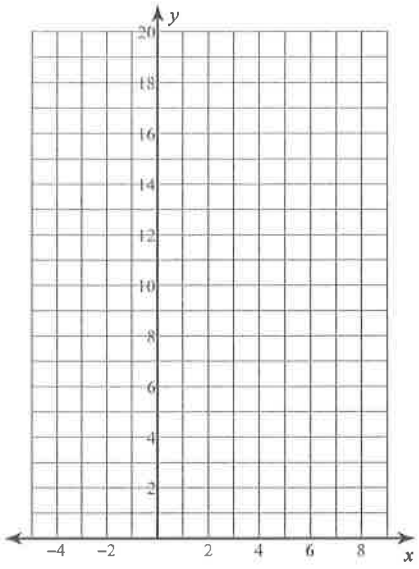
3) $y = 4 \cdot \left(\frac{1}{2}\right)^x$



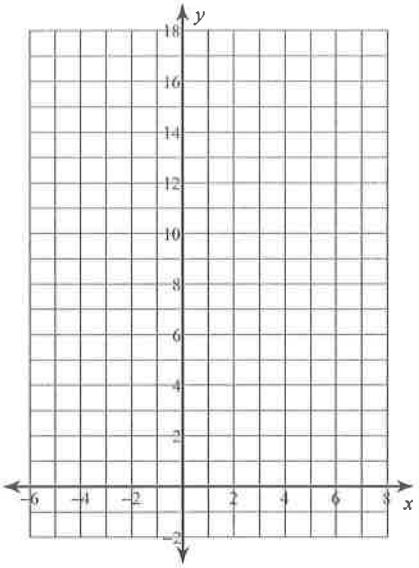
4) $y = 2 \cdot \left(\frac{1}{2}\right)^x$



5) $y = 3 \cdot 2^{x-2} + 2$

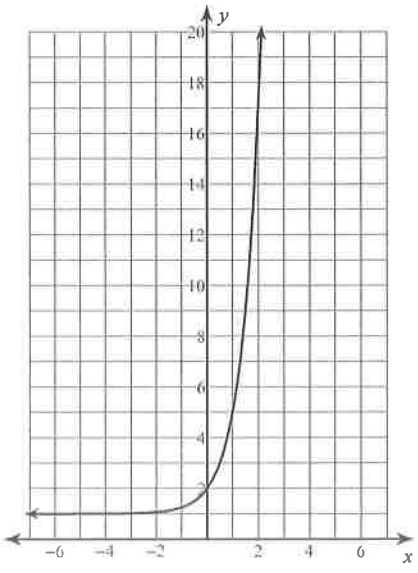


6) $y = 4 \cdot \left(\frac{1}{2}\right)^{x-1} - 2$



Write an equation for each graph.

7)



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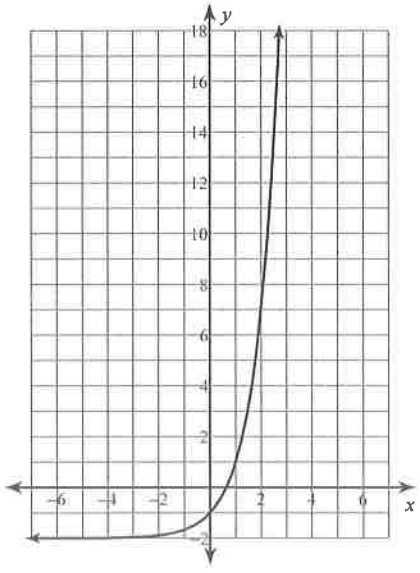


Kuta Software - Infinite Algebra 2 T7-2/Day 3 Name_____

Exponential Equations Not Requiring Logarithms

Date_____ Period____

Solve each equation.

1) $4^{2x+3} = 1$

2) $5^{3-2x} = 5^{-x}$

3) $3^{1-2x} = 243$

4) $3^{2a} = 3^{-a}$

5) $4^{3x-2} = 1$

6) $4^{2p} = 4^{-2p-1}$

7) $6^{-2a} = 6^{2-3a}$

8) $2^{2x+2} = 2^{3x}$

9) $6^{3m} \cdot 6^{-m} = 6^{-2m}$

10) $\frac{2^x}{2^x} = 2^{-2x}$

11) $10^{-3x} \cdot 10^{x} = \frac{1}{10}$

12) $3^{-2x+1} \cdot 3^{-2x-3} = 3^{-x}$

13) $4^{-2x} \cdot 4^{x} = 64$

14) $6^{-2x} \cdot 6^{-x} = \frac{1}{216}$

15) $2^{x} \cdot \frac{1}{32} = 32$

16) $2^{-3p} \cdot 2^{2p} = 2^{2p}$

17) $64 \cdot 16^{-3x} = 16^{3x-2}$

18) $\frac{81^{3n+2}}{243^{-n}} = 3^{4}$

19) $81 \cdot 9^{-2b-2} = 27$

20) $9^{-3x} \cdot 9^{x} = 27$

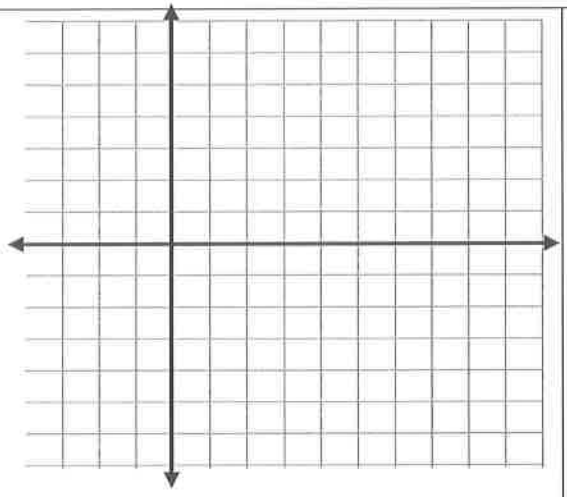
21) $\left(\frac{1}{6}\right)^{3x+2} \cdot 216^{3x} = \frac{1}{216}$

22) $243^{k+2} \cdot 9^{2k-1} = 9$

23) $16^{r} \cdot 64^{3-3r} = 64$

24) $16^{2p-3} \cdot 4^{-2p} = 2^{4}$

Example
1.



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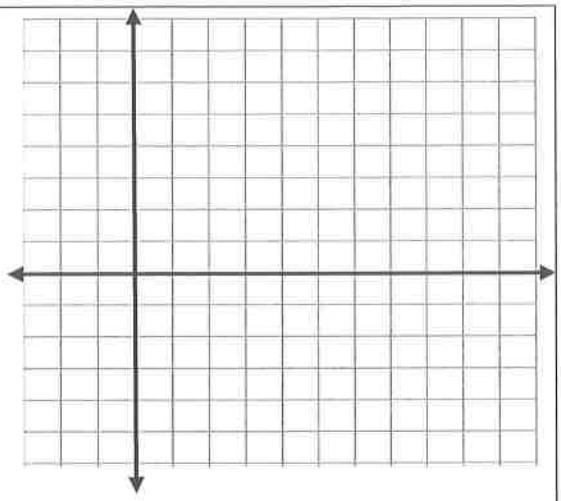
2.



Example
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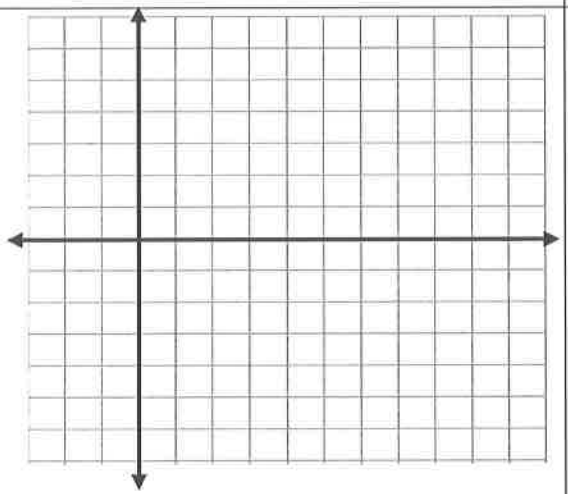
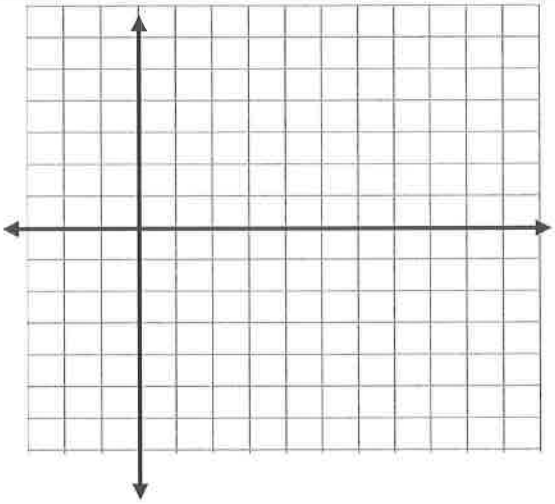
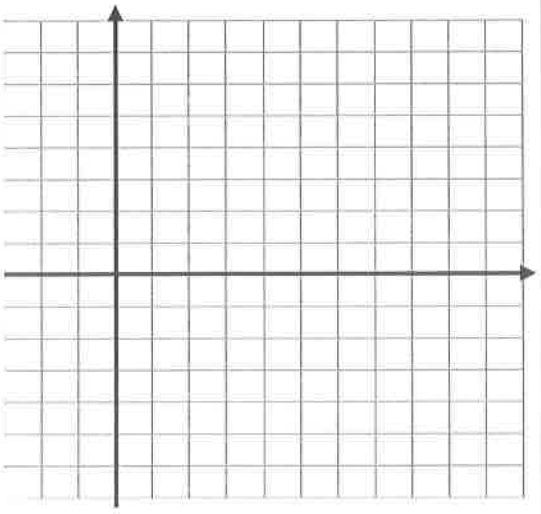


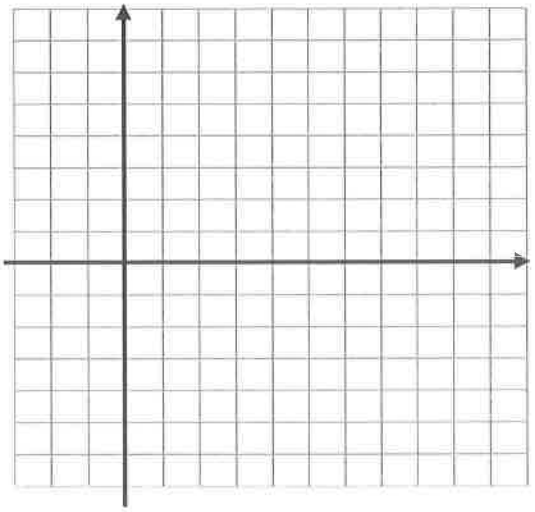
You Try
4.



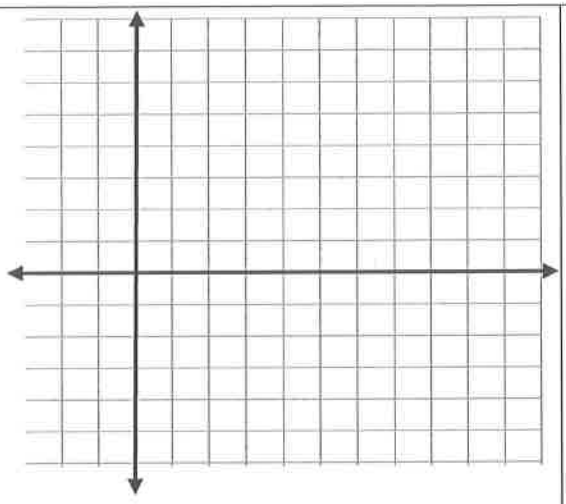
Example
5.



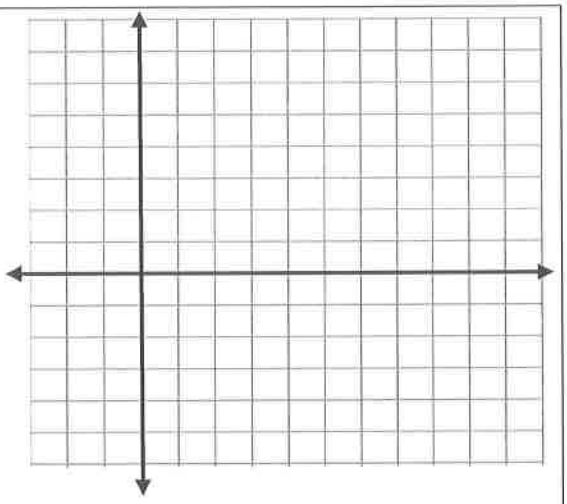
Example
6.



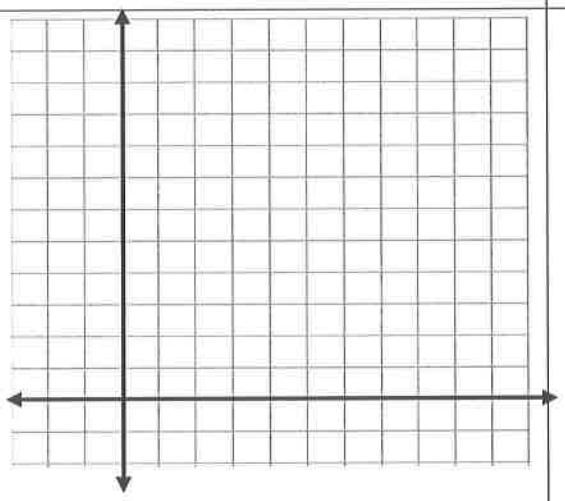
You Try
7.



HW 37.



HW 39.



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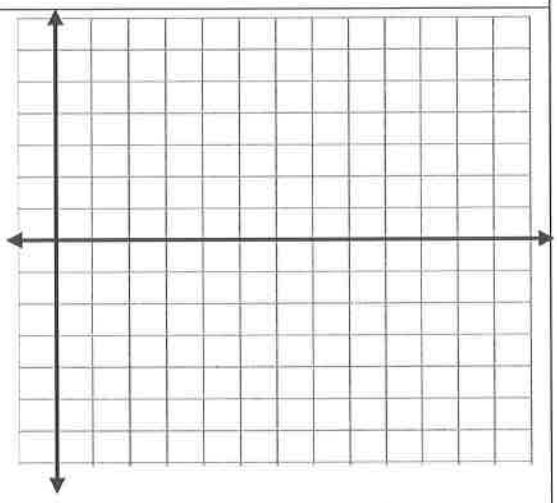

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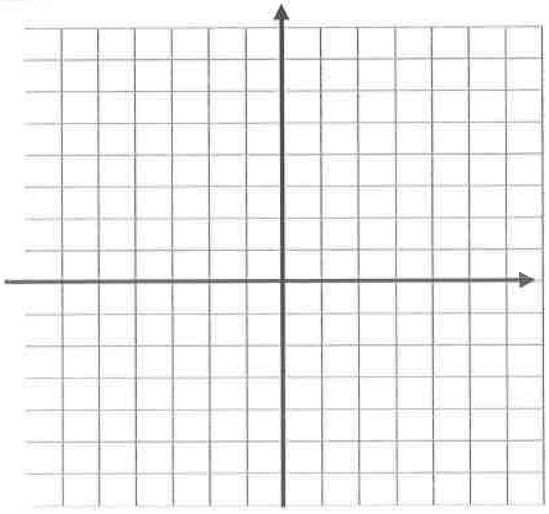
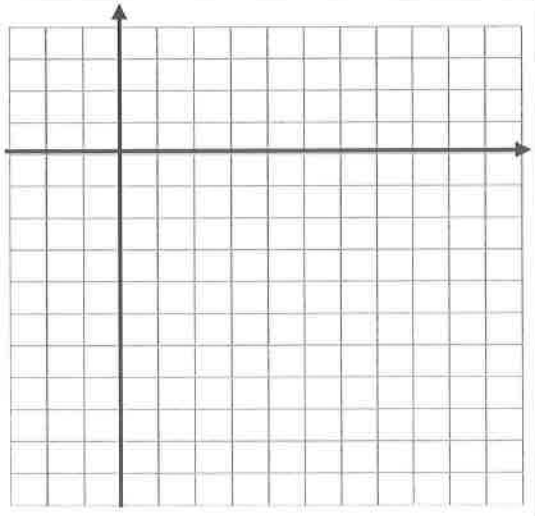


HW 45.



NAME _____ DATE _____ PERIOD _____

T7-3 (Section 7.4 in book)

Solving Logarithmic Equations

Solving Logarithmic Equations

Property of Equality for Logarithmic Functions	If b is a positive number other than 1, then $\log_b x = \log_b y$ if and only if $x = y$.

Example 1: Solve $\log_2 2x = 3$.

$\log_2 2x = 3$	Original equation
$2x = 2^3$	Definition of logarithm
$2x = 8$	Simplify.
$x = 4$	Simplify.

The solution is $x = 4$.

Example 2: Solve the equation $\log_2 (x + 17) = \log_2 (3x + 23)$.

Since the bases of the logarithms are equal, $(x + 17)$ must equal $(3x + 23)$.

$(x + 17) = (3x + 23)$

$-6 = 2x$

$x = -3$

Exercises

Solve each equation.

1. $\log_2 32 = 3x$

2. $\log_3 2c = -2$

3. $\log_{2x} 16 = -2$

4. $\log_{25} \left(\frac{x}{2}\right) = \frac{1}{2}$

5. $\log_4 (5x + 1) = 2$

6. $\log_8 (x - 5) = \frac{2}{3}$

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

8. $\log_2 (x^2 - 6) = \log_2 (2x + 2)$

9. $\log_x + \log_4 27 = 3$

10. $\log_2 (x + 3) = 4$

11. $\log_x 1000 = 3$

12. $\log_8 (4x + 4) = 2$

13. $\log_2 x = \log_2 12$

14. $\log_3 (x - 5) = \log_3 13$

15. $\log_{10} x = \log_{10} (5x - 20)$

16. $\log_5 x = \log_5 (2x - 1)$

17. $\log_4 (x + 12) = \log_4 4x$

18. $\log_6 (x - 3) = \log_6 2x$

(Day 5)

Kuta Software - Infinite Algebra 2 (Day 6) Name_____

Properties of Logarithms T7-3 (in class work) Date_____ Period____

Expand each logarithm.

1) $\log (6 \cdot 11)$

2) $\log (5 \cdot 3)$

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

4) $\log (3 \cdot 2^3)$

5) $\log \frac{2^4}{5}$

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

7) $\log \frac{x}{y^6}$

8) $\log (a \cdot b)^2$

9) $\log \frac{u^4}{v}$

10) $\log \frac{x}{y^5}$

11) $\log \sqrt[3]{x \cdot y \cdot z}$

12) $\log (x \cdot y \cdot z^2)$

Condense each expression to a single logarithm.

13) $\log 3 - \log 8$

14) $\dfrac{\log 6}{3}$

15) $4\log 3 - 4\log 8$

16) $\log 2 + \log 11 + \log 7$

17) $\log 7 - 2\log 12$

18) $\dfrac{2\log 7}{3}$

19) $6\log_3 u + 6\log_3 v$

20) $\ln x - 4\ln y$

21) $\log_4 u - 6\log_4 v$

22) $\log_3 u - 5\log_3 v$

23) $20\log_6 u + 5\log_6 v$

24) $4\log_3 u - 20\log_3 v$

Critical thinking questions:

25) $2(\log 2x - \log y) - (\log 3 + 2\log 5)$

26) $\log x \cdot \log 2$

Name/Per:_____

Target 7-2 & Target 7-3 Applications Homework (Sec 7.8)(Day 7)

Write and equation for each problem and then solve accordingly.

1. Find a bank account balance if the account starts with $100, has an annual rate of 4%, how long will it take to double your money?

   Equation:_____

   Solution:_____

2. An adult takes 400 mg of ibuprofen. Each hour, the amount of ibuprofen in the person's system decreases by about 29%. How long until there are only 10mg of ibuprofen left in the body?

   Equation:_____

   Solution:_____

3. In 1985, there were 285 cell phone subscribers in the small town of Centerville; the number of subscribers increased by 75% per year after 1985. How long until the cell phone subscribers are above 25,000?

   Circle one
   Growth/Decay/Compound Interest

   Equation:_____

   Solution:_____

4. Each year the local country club sponsors a tennis tournament. Play starts with 128 participants. During each round, half of the players are eliminated. How long until there are a third of the participants left?

   Equation:_____

   Solution:_____

5. You buy a new computer for $2100. The computer decreases by 50% annually. When will the computer have a value of $600?

   Equation:_____

   Solution:_____

Name/Per:_____

6. You deposit $1600 in a bank account. Find when you have $7,000 for the following situations:

   a. The account pays 2.5% annual interest compounded monthly.

   Equation:_____

   Solution:_____

   b. The account pays 1.75% annual interest compounded quarterly.

   Equation:_____

   Solution:_____

   c. The account pays 4% annual interest compounded yearly

   Equation:_____

   Solution:_____