

Name: _____

UNIT #6 *Study Guide*
COMMON CORE ALGEBRA I

Study Guide

PART I QUESTIONS: Show all of your work.

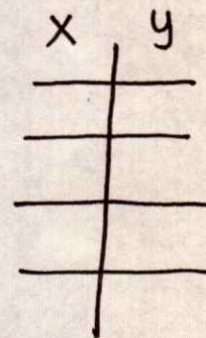
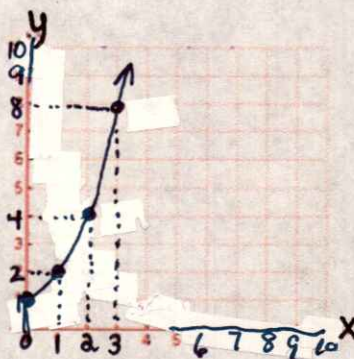
1. If $f(x) = 5^x$, then which of the following is the value of $f(-3)$?

Fraction Answer

2. The population of deer in a forest was measured to be 1800 in the year 2010. If the population increased by a steady 6% per year, which of the following calculations would predict its population in 2015?

3. $(7^2)^8$ then what does x equal in 7^x ?

4. Which of the following exponential equations could describe the graph shown below?



5. A t-shirt was originally priced at \$25, but was placed on sale for 20% off the original price. If a sales tax of 7% was added on to the sale price, what did the t-shirt cost at the register, including the tax?

6. The number of new visits to a website is decreasing exponentially. It can be modeled by the function $h(d) = 2530(0.88)^d$, where h is the number of new site hits and d is the number of days since the site opened. Which of the following is the difference of h over the interval when $d = 3$ and $d = 5$

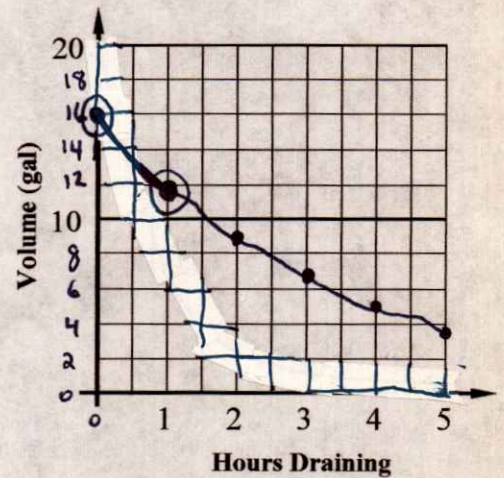
7. If the first two terms of a geometric sequence are $a_1 = 112$ and $a_2 = 28$ then which of the following is the third term, a_3 ?

$\frac{1}{a_1}, \frac{1}{a_2}, \frac{1}{a_3}$

8. Jenna's rent is increasing from \$750 per month to \$850 per month. The percent increase in her rent is closest to which of the following?

9. A tank is draining water such that the volume is given with an exponentially decreasing graph as shown in the graph below. If the volume was modeled with an equation of the form $V = a(b)^t$, where t is the number of hours, then which of the following is the best value for b ?

| hours | volume |
|-------|--------|
| 1 | |
| 0 | |



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Unit 6 Algebra

10. The expression $(6x^2)^3 (4x)^2$ is the same as

PART II QUESTIONS: Show all of your work.

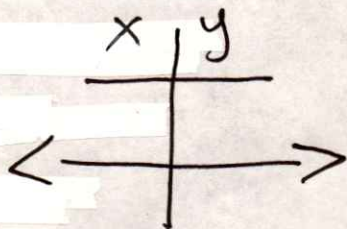
11. Jeremy was taking a quiz in his Algebra I class. He decided that the expression $3^{-1} + 4^0$ had a value of $1\frac{1}{3}$. Is Jeremy correct?

12. Write the following expression in simplest form. $(2x^7)^6$

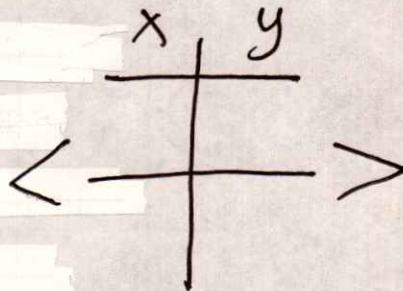
PART III QUESTIONS: Show all of your work.

Write the equations of the linear and exponential functions that pass through the points $(0, 15)$ and $(1, 5)$

13. Linear Equation, $y = mx + b$
What is m ? _____



14. Exponential Equation, $y = b(c)^x$:

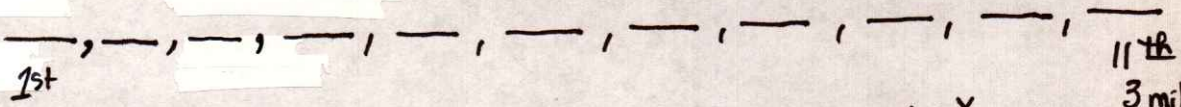


15. The population of Nottingham High School can be modeled using the equation $P(t) = 1,700(.95)^t$, where t is the number of years since 2000. Is the population of Nottingham increasing or decreasing? Explain how you can tell using the equation.

16. From #15, how do you interpret the statement that $P(11)$? $p(11) = 1,700 (.95)^{11}$

17. Given the geometric sequence with the first three terms shown below, answer the following questions.

The sequence 3, 12, 48, what is 11th term of this sequence?



18. From #17, write a model from the sequence 3, 12, 48, ...

$$y = B(c)^x$$

$$y = \text{---}(\text{---})^x$$

3 million something

PART IV QUESTION: Show all of your work.

19. The population of Ashmore was 1200 in 2000 and 1440 in 2001. The linear model for Ashmore's population is $P = 240(t) + 800$, where t is the years since 2000. Write an exponential model, in the form $P = a(b)^t$, for Ashmore's population t -years after 2000.

20. From #19, how much greater is the population predicted by the exponential model than that predicted by the linear model for the year 2009? Let $t = 9$ years.