

Name: Unit 5

Trial Test

1. Given the following exponential function, find the following:

$$f(x) = 12(0.9)^x$$

- a. Evaluate $f(9)$ and round to 3 decimal places if needed.

- b. Determine the initial value.

- c. State the value of the base (also called a growth or decay factor)

- d. Determine whether the function is growth or decay.

Growth

Decay

2. Given $f(x) = \log_3(x - 5)$, state the domain.

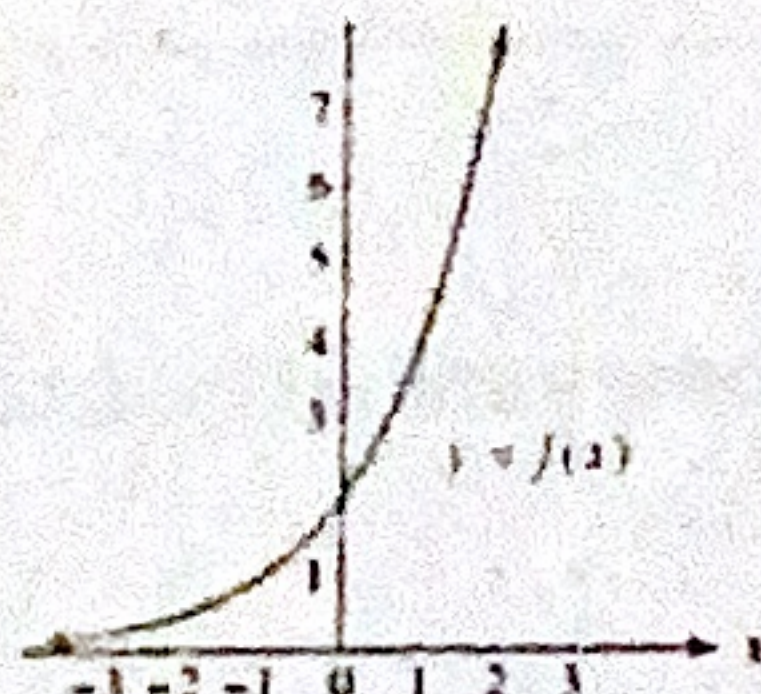
- a. $(-\infty, \infty)$

- b. $(-5, \infty)$

- c.
- $(5, \infty)$

- d. $(-\infty, 5)$

3. Determine whether each table/graph/situation represents exponential growth or decay.

						(Circle your answer)													
<table border="1"><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>y</td><td>54.5</td><td>38.6</td><td>26.9</td><td>18.7</td><td>9.8</td></tr></table>						x	1	2	3	4	5	y	54.5	38.6	26.9	18.7	9.8	Growth	Decay
x	1	2	3	4	5														
y	54.5	38.6	26.9	18.7	9.8														
Twenty thousand dollars is deposited in an account that doubles every year.						Growth	Decay												
						Growth	Decay												

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4. Find an exponential model for the function that passes through the following two points by determining values for C and a so that $f(x) = Ca^x$.

x	$f(x)$
-2	512
1	16

$C =$ _____

$a =$ _____

5. Change the equation to its equivalent exponential form.

$$\log_2(5x) = 4$$

a. $\log_4(2) = 5x$	b. $5x^2 = 4$	c. $2^4 = 5x$	d. $4^2 = 5x$
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6. Change the equation to its equivalent logarithmic form.

$$9^x = 729$$

a. $\log_{729}(x) = 9$	b. $\log_9(x) = 729$	c. $729^x = 9$	d. $\log_9(729) = x$
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7. The population of Arizona was 6.6 million in 2010 and was growing continuously at a 1.44% rate. Assuming this trend continued, estimate the population of Arizona in 2016.

a. about 7.5 million	b. about 6.2 million	c. about 7.2 million	d. about 6.5 million
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8. Carly invested \$3000 in a bank account at an interest rate of 2.75% compounded quarterly. How much money would she have after 15 years?

a. \$4,531.77	b. \$4,525.38	c. \$4,529.63	d. \$4,523.26
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9. Use properties of logarithm to expand the expression.

$$\ln \frac{x^3 y}{5}$$

a. $3 \ln x + \ln y - \ln 5$	b. $3 \ln xy - \ln 5$	c. $\ln 3xy - \ln 5$	d. $3 \ln x - \ln y - \ln 5$
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10. Use properties of logarithm to combine the following by writing it as a single expression.

$$5 \log_2(x) - 2 \log_2(x + 1)$$

a. $\log_2 x^5(x + 1)^2$	b. $\log_2 x^5 - \log_2(x + 1)^2$	c. $3 \log_2 \frac{x}{(x+1)}$	d. $\log_2 \frac{x^5}{(x+1)^2}$
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11. The equation below has a solution of $x = 7$. Use the properties of logarithm to solve the equation and find the extraneous solution or state that there is none by selecting the correct choice below.

$$\ln(x + 5) + \ln(x - 6) = \ln(18)$$

- a. The extraneous solution is $x = -2$.
- b. The extraneous solution is $x = -6$.
- c. The extraneous solution is $x = 5$.
- d. The extraneous solution is $x = 0$.
- e. There is no extraneous solution.

12. Solve the following equation algebraically. Leave your solutions in their EXACT form.

$$3(7^x) - 6 = 18$$

Solution: _____

Name: _____

13. Solve the following equation algebraically. Leave your solutions in their EXACT form.

$$\log_4(x - 9) = 3 - \log_4(5)$$

Solution: _____

14. Solve the following equation algebraically. Leave your solutions in their EXACT form.

$$8\ln(12x) = 384$$

Solution: _____

15. Suppose the population of California in millions t years after 2010 can be modeled by $P(t) = 37.3e^{0.01t}$.

- a. What would be the population of California in the year 2017?
- b. Approximate the year when the population will reach 40 million