**Exponential function Unit Test**

**Name:**

**Section A: Selected Response. Place the UPPER-CASE letter corresponding to the correct answer in the space provided. (10 points)**

\_\_\_\_\_\_1. Which of the following is true about the function y=0.75$(0.4)^{x}$ ?

1. Growing exponentially with an initial value of 0.75
2. Growing exponentially with an initial value of 0.4
3. Decaying exponentially with an initial value of 0.75
4. Decaying exponentially with an initial value of 0.4

\_\_\_\_\_\_2. Solve for $3^{4x}=9^{5x+1}$

1. -1 b)$ -\frac{1}{3}$ c)$ -\frac{1}{6}$ d)$ -\frac{3}{11}$

\_\_\_\_\_\_3. Solve for $10^{-2}\left(10^{1}+10^{0}\right)= $

1. $10^{-2}$ b)$ 1.1$ c)$ 0.1$ d)$ 10$

\_\_\_\_\_\_4. What of the following functions represents f(x)=$ 9^{x}$ after a reflection on the x-axis and a vertical translation 3 units up?

1. $y=-(9^{x-3})$ b)$ y=-\left(9^{x}\right)-3$ c)$ y=9^{-x+3}$ d)$ y=-\left(9^{x}\right)+3$

\_\_\_\_\_\_5. An antique was worth $1500 in 1980 and has been increasing in value by 9% every year. What is the total value of the antique in 2005?

1. y=1500$(0.09)^{25}$ b) y=1500$(0.01)^{25}$ c) y=1500$(1.09)^{25}$ d) y=1500$(0.91)^{25}$

\_\_\_\_\_\_6. What is the equation of the horizontal asymptote of the function y=2$(3)^{x}-$ 4 ?

1. x=2 b) y=2 c) x= $-$4 d) y= $-$4

\_\_\_\_\_\_7. Which set of properties does the function y=$3^{x}$ have?

1. No x-intercept, no y-intercept
2. No x-intercept, y-intercept is 1
3. x-intercept is 1, no y-intercept
4. x-intercept is 0, y-intercept is 0

\_\_\_\_\_\_8. A colony of ants has an initial population of 750 and triples every day. Which function can be used to model the ant population, *p,* after t days?

1. *P*(t)= 3$(750)^{t}$ b) *P*(t)= $\frac{1}{3}(750)^{t}$ c) *P*(t)= 750$(\frac{1}{3})^{t}$ d) *P*(t)= 750$(3)^{t}$

\_\_\_\_\_\_9. The equation of 10$ (\frac{1}{5})^{n}$ can also be written as:

1. a= 5$(5)^{n}$ b) a= $5(5)^{-n}$ c) a= $10(5)^{n}$ d) a= $10(5)^{-n}$

\_\_\_\_\_\_10. For the exponential function y=10$(\frac{1}{5})^{n}$, which of the following statement is not true?

1. The graph of the function is decreasing
2. The domain of the function is x$ϵR$
3. The graph of the function is increasing
4. The range of the function is y$ >0$

**Section B: Open Response. (Show all your work in the space provided.)**

**1. Solve for the variable in each of the following: (3 points each)**

a) $8^{x+2 }=32^{(x+1)}$ b)$ 3^{4x }=27^{(x+5)}$ c) $(\frac{1}{4})^{x-5} -5=3$ d) $(\frac{1}{27})^{3x} ∙3=$ $9^{x+1}$

**2.** Wilson knows that his investment of $2000 will double every ten years in an account that compounds interest annually. He assumes that his investment will be worth $3000 in 5 years. Is his assumption correct? Explain. (3 points)

**3.** Ryan and Rachel have bought a home for $400 500 in Vancouver. The real estate agent informs them that homes in the area have generally increased by 2% every 5 years. Based on this, how should they be able to sell their home for in 12 years? (3 points)

**Section C: Characteristics and Transformation of exponential function**

**1)**

Look at the graph of exponential function, and identify all the following1 characteristics: (8 points)

1. y=$5^{x}$

Domain:

Range:

y-intercept:

x-intercept:

Horizontal asymptote:

Increasing or decreasing?

Exponential growth or exponential decay?

1. y=$ 4 (\frac{1}{2})^{x}-2$

Domain:

Range:

y-intercept:

x-intercept:

Horizontal asymptote:

Increasing or decreasing?

Exponential growth or exponential decay?

Describe the transformation of the function when compared to the function of $y=(\frac{1}{2})^{x}$

 

2) Sketch the following two graphs (6 points)

1. y=$ (\frac{1}{2})^{x-3}-2$



1. y=$ 3(5)^{x-2}$

