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Algebra 1- Unit 4- Study Guide

1. Given $f(x) = 2^x$ and $g(x) = -3(2)^x + 7$, describe the transformations performed on $f(x)$ to get $g(x)$.

a. Growth or Decay: Growth

b. Reflection: yes

c. Vertical Shift: up 7

d. Asymptote: $y = 7$

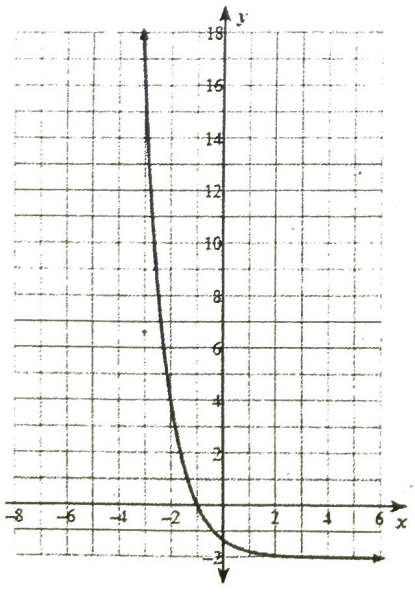
e. Vertical Stretch or Compression: Stretch

f. Horizontal Shift: none

4. Write an equations represents a reflection over the x-axis, horizontal shift left 4 units, vertical shift up 8 units, and a shrink from the parent function $f(x) = 2^x$?

$$f(x) = -\left(\frac{1}{4}\right)2^{x+4} + 8$$

5.



A. Growth or Decay: Decay

B. X- Intercept: $(-1, 0)$

C. Y- Intercept: $(0, -1.25)$

D. Domain: all real numbers

E. Range: $y > -2$ or $(-2, \infty)$

F. End Behavior: As x increases f(x) -2

As x decreases f(x) ∞

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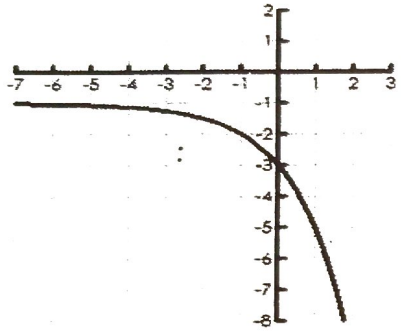
6. What is the asymptote of the function: $f(x) = (1/4)^x - 3$?

$y = -3$

7.

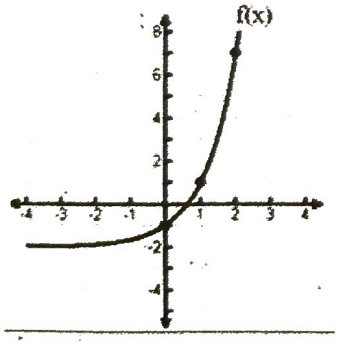


Range: $y < -1$ or $(-1, -\infty)$

Domain: all real #s

State the range and the domain for the function.

8.



A. Growth or Decay:

Growth

B. X- Intercept:

$(-0.5, 0)$

C. Y- Intercept:

$(0, -1)$

D. Domain:

all real numbers

E. Range:

$y > -2$ or $(-2, \infty)$

9. What is the asymptote of the graph of the function $f(x) = 4(2)^x$?

$y = 0$

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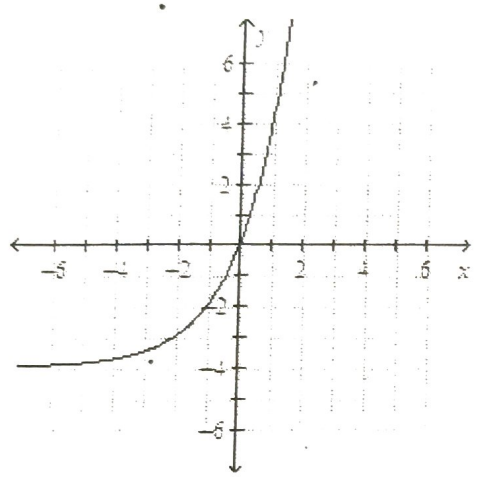
10. Describe the functions characteristics

A.



A. Growth or Decay:

Growth

B. Asymptote:

$y = -4$

C. X- Intercept:

(0,0)

D. Y- Intercept:

(0,0)

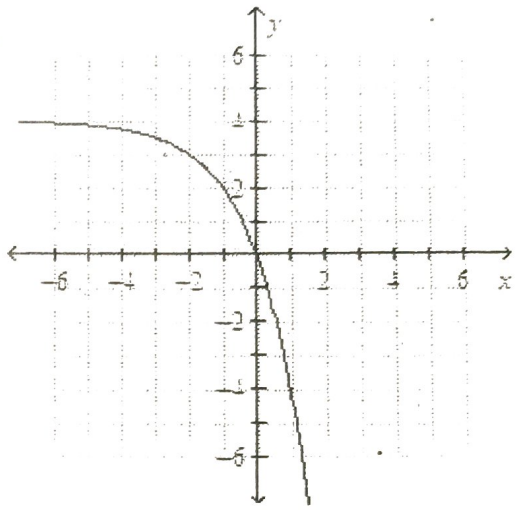
E. Domain:

all real numbers

F. Range:

$y > -4$ or $(-4, \infty)$

G. B.



A. Growth or Decay:

Decay

H. Asymptote:

$y = 4$

I. X- Intercept:

(0,0)

J. Y- Intercept:

(0,0)

K. Domain:

all real numbers

L. Range:

$y < 4$ or $(4, -\infty)$

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11. What is the *y*-intercept of the function whose equation is $y = 3(2)^x$? Set $x=0$

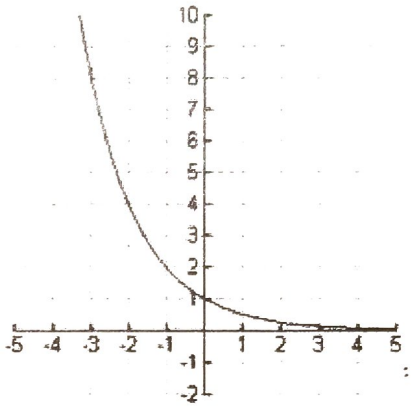
$y=3(2)^0$

$y=3(1)$

3

$\boxed{(0,3)}$

12.



Describe the end behavior of the function.

As $x \to -\infty$ $f(x) \to$ ∞ As $x \to \infty$ $f(x) \to$ 0

13. The function $f(t) = 20{,}000(.85)^t$ gives the value of a vehicle where t is the number of years after purchase. According to the function, what will be the value of the car 5 years after purchase, rounded to the nearest dollar?

$20{,}000(0.85)^5$

$\boxed{8874.11}$

14. A culture of bacteria triples every hour. If there are 200 bacteria at the beginning, how many bacteria will there be after 7 hours?

$200(3)^7$

$\boxed{437400}$

15. Given the function $f(x) = 545\ (.34)^x$, determine if this function models exponential growth or decay and identify the growth or decay rate.

Decay

$1 - r = 0.34$

$-1 \quad -1$

$-r = -0.66$

$r = 0.66\ (100)$

66%

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16. The population of a small town has established a growth rate of 7% per year. If the current population is 2000, and the growth rate remains steady, how many years will it take for the population to first go over 3000?

$2000(1+0.07)^{6} = 3001.46$

6 years

17. Janelle decided to invest money in an account that earns 4% compounded semi-annually. If she initially deposited $3,250.00 into the account and adds nothing to it, how much will it be worth in 7 years?

$A = 3250\left(1+\frac{0.04}{2}\right)^{2(7)}$

$A = 4288.31$

18. Sarah has deposited $4500.00 in a savings account that earns 0.1% interest compounded quarterly. How much money will she have after 12 years?

$A = 4500\left(1+\frac{0.001}{4}\right)^{4(12)}$

$A = 4554.32$

19. John purchases a car for $19,500 at a fixed interest rate of 3.75% compounded weekly for 8 years.

Part A: Write an equation for the scenario.

$A = 19500\left(1+\frac{0.0375}{52}\right)^{52(8)}$

Part B: How much will John pay in total for the car?

26319.40

Part C: How much will John pay in interest only?

Interest = end amount - initial amount

26319.40 - 19500

Interest = 6819.40