

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

**Unit 7 Corrective Assignment – Exponential Functions**

**Are the following functions exponential, linear, or neither? [2 points each]**

1. $f(x) = 12x$	2. $f(x) = x^{12}$	3. $f(x) = 12^x$	4. $f(x) = -5x$
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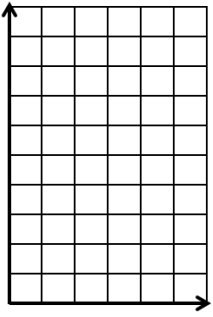
**State whether the formula models exponential growth or decay. Justify your response. [2 pts]**

5. $f(x) = 10\left(\frac{11}{3}\right)^x$	6. $f(x) = 0.25(3)^x$	7. $f(x) = 4.5(0.1)^x$	8. $f(x) = 0.2\left(\frac{6}{21}\right)^x$
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**Sketch the graph by filling out a T-chart. Find AT LEAST THREE points (even if they can't all fit on the graph). [3 points each]**

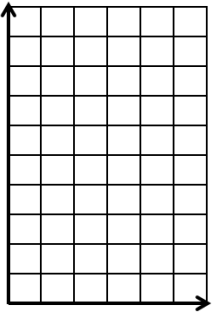
9.  $f(x) = 3(2.2)^x$

$x$	$y$
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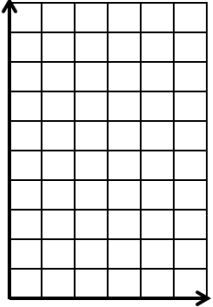
10.  $f(x) = 8(0.6)^x$

$x$	$y$
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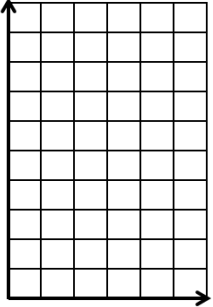
11.  $f(x) = 6\left(\frac{1}{2}\right)^x$

$x$	$y$
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12.  $f(x) = 2^x$

$x$	$y$
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**For each equation, identify the initial value (I.V.) and the percent increase or decrease. [3 points]**

13.  $f(x) = 0.9(1.262)^x$

I.V. \_\_\_\_\_  
% Inc/Dec: \_\_\_\_\_

14.  $f(x) = 19(0.4)^x$

I.V. \_\_\_\_\_  
% Inc/Dec: \_\_\_\_\_

15.  $f(x) = 5(0.644)^x$

I.V. \_\_\_\_\_  
% Inc/Dec: \_\_\_\_\_

16.  $f(x) = 5.2(3.302)^x$

I.V. \_\_\_\_\_  
% Inc/Dec: \_\_\_\_\_

**Identify the type of relationship and create a function from the given information. [3 points each]**

17. Mr. Bean's custom scooter is worth \$506, but is increasing in value  $v$  by 4% every year  $t$ .

- a. Exponential Growth
- b. Exponential Decay
- c. Linear Growth
- d. Linear Decay

Function: \_\_\_\_\_

18. Mr. Bean's scooter just got new tires that have a tread depth  $d$  of 0.3 inches and decays at a rate of 2.8% per month  $m$ .

- a. Exponential Growth
- b. Exponential Decay
- c. Linear Growth
- d. Linear Decay

Function: \_\_\_\_\_

19. You have \$100 in savings  $s$  but are paying for a phone that costs \$20 per month  $m$ .

- a. Exponential Growth
- b. Exponential Decay
- c. Linear Growth
- d. Linear Decay

Function: \_\_\_\_\_

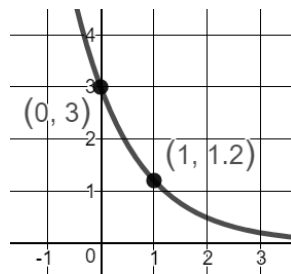
20. You purchase a car a baseball card for \$50. The value  $v$  of the card increases by \$1.50 per year  $t$ .

- a. Exponential Growth
- b. Exponential Decay
- c. Linear Growth
- d. Linear Decay

Function: \_\_\_\_\_

21. Use  $x$  and  $f(x)$  for your variables.

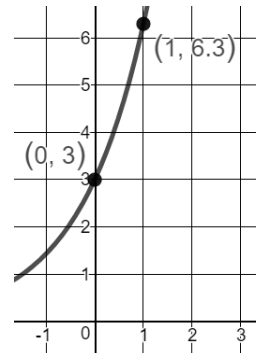
- a. Exponential Growth
- b. Exponential Decay
- c. Linear Growth
- d. Linear Decay



Function: \_\_\_\_\_

22. Use  $x$  and  $f(x)$  for your variables.

- a. Exponential Growth
- b. Exponential Decay
- c. Linear Growth
- d. Linear Decay



Function: \_\_\_\_\_

23.

$c$	0	1	2	3
$T(c)$	0.2	1.62	13.122	106.2882

- a. Exponential Growth
- b. Exponential Decay
- c. Linear Growth
- d. Linear Decay

Function: \_\_\_\_\_

24.

$t$	0	1	2	3
$a(t)$	10	8	6.4	5.12

- a. Exponential Growth
- b. Exponential Decay
- c. Linear Growth
- d. Linear Decay

Function: \_\_\_\_\_

**Create a model (equation) for each scenario. Use function notation to answer the question. [4 pts each]**

25. A population  $p$  of 22 mice doubles every 3 weeks  $w$ . How many mice will there be in 19 weeks?

26. In 2025, you purchase a new car for \$35,000. The value  $v$  of the car decreases by 4.8% per year  $t$ . How much will the car be worth in 2030?

27. The rodent population  $p$  in a large city is being controlled by a new poison that kills half the population every 2 months  $m$ . If there are currently 1,000,000 rodents in the city, how many will there be in 12 months?

28. A wound on your leg is 3 square inches. It heals at a rate such that the area  $a$  of the wound decreases by 8% per day  $d$ . How large will the wound be in 2 weeks?

29. The weight of a small catfish  $c$  is measured in pounds. The following equation models its weight over a certain number of weeks  $w$ .

$$c(w) = 0.1(1.23)^w$$

- a. How much does the catfish weigh when it is first measured?
- b. What is the percent increase/decrease of the catfish every week?
- c. How much will the catfish weight after 4 weeks?

30. Find the product of  
 $(x - 5)(4x - 1)$

31.

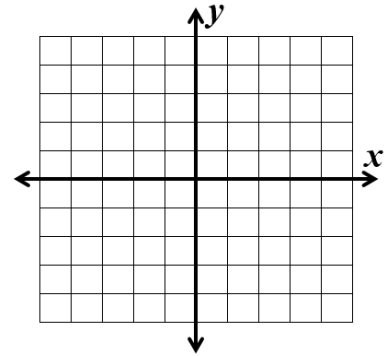
x	y
0	10
5	25
6	19
10	50
15	51
21	74

Find the LINEAR regression equation for the data above.

Equation: \_\_\_\_\_

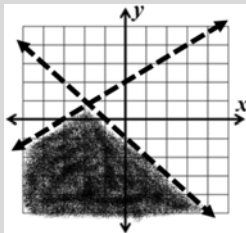
32. Graph the following:

$$\begin{cases} y < -x - 1 \\ y \leq \frac{2}{3}x + 2 \end{cases}$$



33. Solve:  $\frac{x+2}{4} - 5 = -3$

Answers to Unit 3 Corrective Assignment

1. Linear	2. Neither	3. Exponential	4. Linear	5. Exp Growth b/c $b > 1$	6. Exp Growth b/c $b > 1$	7. Exp Decay b/c $0 < b < 1$
8. Exp Decay b/c $0 < b < 1$	9. Three points: (0, 3), (1, 6.6), (2, 14.52)	10. Three points: (0, 8), (1, 4.8), (2, 2.88)	11. Three points: (0, 6), (1, 3), (2, 1.5)	12. Three points: (0, 1), (1, 2), (2, 4)		
13. Initial Value: 0.9 26.2% increase	14. Initial Value: 19 60% decrease	15. Initial Value: 5 35.6% decrease	16. Initial Value: 5.2 230.2% increase			
19. Linear Decay $s(m) = 100 - 20m$	20. Linear Growth $v(t) = 50 + 1.5t$	21. Exponential Decay $f(x) = 3(0.4)^t$	22. Exponential Growth $f(x) = 3(2.1)^x$			
23. Exponential Growth $T(c) = 0.2(8.1)^c$	24. Exponential Decay $a(t) = 10(0.8)^t$	25. $p(t) = 22(2)^{\frac{w}{3}}$ $p(19) = 1773.97$ mice	26. $v(t) = 35,000(0.952)^t$ $v(5) = \$27,368.61$			
27. $p(m) = 1,000,000 \left(\frac{1}{2}\right)^{\frac{m}{2}}$ $p(60) = 15,625$ rodents	28. $a(d) = 3(0.92)^d$ $a(14) = 0.93$ inches <sup>2</sup>	29a. 0.1 pounds	29b. 23% increase	29c. $c(4) = 0.23$ pounds		
30. $x^2 - 21x + 5$	31. $y = 3.09x + 8.8$	32. 		33. $x = 6$		