Review for Unit 3 Quiz #2

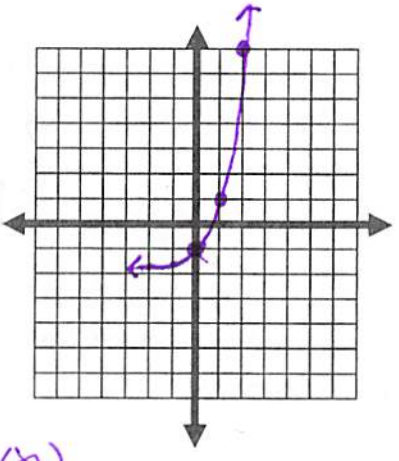
KEY

Name: _____ Date: _____

For each of the functions, graph using a table of values and find the following information.

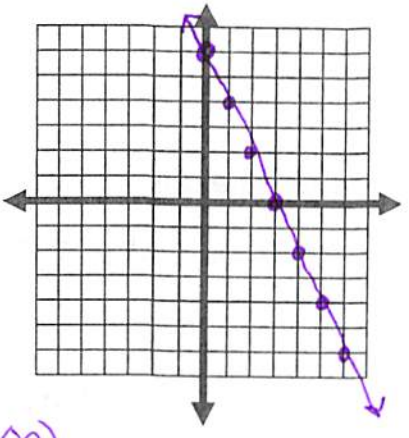
1. $f(x)=3^x-2$

X	Y
-2	-1.88
-1	-1.67
0	-1
1	1
2	7



Domain: $(-\infty, \infty)$
Range: $(-2, \infty)$
x - intercept: between 0 & 1
y- intercept: $(0, -1)$
Interval of Increasing: $(-\infty, \infty)$
Interval of Decreasing: none
Asymptote: $y=-2$

2. $f(x)=-2x+6$



Domain: $(-\infty, \infty)$
Range: $(-\infty, \infty)$
x - intercept: $(3, 0)$
y- intercept: $(0, 6)$
Interval of Increasing: none
Interval of Decreasing: $(-\infty, \infty)$
Asymptote: none

Evaluate the function $f(x)=3x^2-2x-5$

5. $f(4)=$ 35

$3(4)^2-2(4)-5$

6. $f(-2)=$ 11

$3(-2)^2-2(-2)-5$

Given the functions: $f(x)=3x^2-2x+1$, $g(x)=2x^2-5x-4$

7. Find f(x) – g(x) x^2+3x+5

$3x^2-2x+1-(2x^2-5x-4)$

$3x^2-2x+1-2x^2+5x+4$

8. Find 2f(x) + 4g(x) $14x^2-24x-14$

$2(3x^2-2x+1)+4(2x^2-5x-4)$

$6x^2-4x+2+8x^2-20x-16$

9. Find f(3) + g(4) 30

$f(3)=3(3)^2-2(3)+1=22$ $g(4)=2(4)^2-5(4)-4=8$

10. A battery operated car is traveling on a smooth road at a constant speed. The distance the car will travel is 16 feet the 1st second, 48 feet the next second, 80 feet the third second, and so on. Write an **explicit** formula to model this situation.

$a_n=32n-16$

11. At Kell HS, Savannah, a 10th grader, decides to start a rumor that Lassiter HS is going to declare March 14 a holiday and close school for the day. On the first day of school, she tells 3 students the rumor and gives them instructions to repeat the rumor (and instructions) to 3 more students the next day, etc.

a) Fill out the table at the right from the situation above.

b) Write an **explicit** formula to model this situation.

$a_n = 3(3)^{n-1}$

Day	# of Students hearing the rumor
0	1
1	3
2	9
3	27
4	81

c) If each student follows these instructions, how many students will hear the rumor on **day 6**? $a_n = 3(3)^{6-1}$ $a_6 = 729$

d) How many will hear the rumor after **2 weeks**? (Hint: How many days in a week)

$2(7) = 14$ days $a_{14} = 3(3)^{14-1}$ $a_{14} = 4,782,969$

12. The Money Fairy: The money fairy has given you the following choices.

- **Option A**: He will give you $1,000 a day for the rest of your life.
- **Option B**: He will give you $0.01 today, $0.02 tomorrow, $0.04 the next day, and so on, doubling the amount you receive each day for the rest of your life.

a) Write an **explicit** formula for each option.

Option A: $a_n = 1,000n$ Option B: $a_n = .01(2)^{n-1}$

b) Which option would you choose? Why?

Option B because you end up with more money.

13. Write your own story to match the equation $f(x) = 50x + 75$.

I open a savings account with $75. Each month I deposit $50.

14. Write your own story to match the equation $f(x) = 5(3)^x$

A scientist began a study with 5 bactena. Every hour the amount of bactena triples.

15. Lindsey has two options when it comes to hiring a singing coach. The two tables below represent the amount it will cost Lindsey per hour to hire someone from each company. Her first option is to go with Better Vocals, which is represented as B(x). Her second option is to go with Singing in the Rain, which is represented as S(x). Use the tables to answer the questions below.

x	B(x)
0	45
1	70
2	95
3	120

$B(x) = 25x + 45$

x	S(x)
0	50
1	70
2	90
3	110

$S(x) = 20x + 50$

a. Find the rate of change from [1,3]. Which company has a higher rate of change?

B(x): (1,70)(3,120) $\frac{120-70}{3-1} = \frac{50}{2} = 25$

S(x) = (1,70)(3,110) $\frac{110-70}{3-1} = \frac{40}{2} = 20$

Better Vocals

b. What do the y-intercepts represent?

Initial cost of singing coach to come to your house.

c. If Lindsey needs 5 hours of practice, which company should she choose?

$B(5) = 25(5) + 45$ $B(5) = 170$

$S(5) = 20(5) + 50$ $S(5) = 150$

Singing in the Rain.

16. You have pools that need to be refilled for the summer. They are both start out with the same amount of water, 500 liters, and are gaining water at different rates. The function $f(x) = 500(1.85)^x$ represents the water in Pool A. The function $g(x) = 500(1.88)^x$ represents the water in Pool B.

a. Find the rate of change for each function over the interval [3,7].

Pool A

$f(3) = 3165.81$

$f(7) = 37082.76$

(3, 3165.81)

(7, 37082.76)

$\frac{37082.76 - 3165.81}{7-3} = 8479.24$

Pool B

$g(3) = 3322.34$

$g(7) = 41502.57$

(3, 3322.34)

(7, 41502.57)

$\frac{41502.57 - 3322.34}{7-3} = 9545.06$

b. Which pool has a faster rate of change and will fill up first?

Pool B has a faster ROC & will fill up first.