

READY, SET, GO!

Name	Period	Date
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**READY**

Topic: Distributive Property  
 Simplify the following expressions

- |   |                                |
|---|--------------------------------|
| 1. $3(2x + 7)$<br>$6x + 21$                 | 2. $-12(5x - 4)$               |
| 3. $5a(-3a + 13)$                           | 4. $9x(6x - 2)$                |
| 5. $\frac{2x}{3}(12x + 18)$<br>$8x^2 + 12x$ | 6. $\frac{4a}{5}(10a - 25b)$   |
|   | 7. $\frac{-4x}{11}(121x + 22)$ |

**SET**

Topic: Recognizing Linear Exponential and Quadratic Functions  
 In each set of 3 functions, one will be linear and one will be exponential. One of the three will be a new category of function. List the characteristics in each table that helped you to identify the linear and the exponential functions. What are some characteristics of the new function? Find an explicit and recursive equation for each.

8. Linear, exponential, or a new kind of function?

a.

x	f(x)
6	64
7	128
8	256
9	512
10	1024

$x \downarrow$  1 2  
 $\rightarrow$  64 128 256 512  
 $\rightarrow$  64 128 256

Type and characteristics?  
**Exponential: common ratio**  
 Explicit equation:  
 $f(x) = 2^x$   
 Recursive equation:

b.

x	f(x)
6	36
7	49
8	64
9	81
10	100

$x \downarrow$  1 2  
 $\rightarrow$  13 15 17 19  
 $\rightarrow$  2 2 2 2

Type and characteristics?  
**Quadratic: equal 2nd difference**  
 Explicit equation:  
 $f(x) = x^2$   
 Recursive equation:

c.

x	f(x)
6	11
7	13
8	15
9	17
10	19

$x \downarrow$  1 2  
 $\rightarrow$  2 2 2 2  
 $\rightarrow$  0 0 0 0

Type and characteristics?  
**Linear: equal 1st Difference**  
 Explicit equation:  
 $f(x) = 2x - 1$   
 Recursive equation:

9. Linear, exponential, or a new kind of function?

d.

x	f(x)
-2	-17
-1	-12
0	-7
1	-2
2	3

Type and characteristics?

Linear  
 Explicit equation:  
 $y = 5x - 7$   
 Recursive equation:

e.

x	f(x)
-2	1/25
-1	1/5
0	1
1	5
2	25

Type and characteristics?

exp  
 Explicit equation:  
 $f(x) = 5^x$   
 Recursive equation:

f.

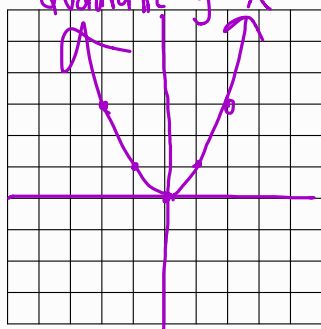
x	f(x)
-2	9
-1	6
0	5
1	6
2	9

Type and characteristics?

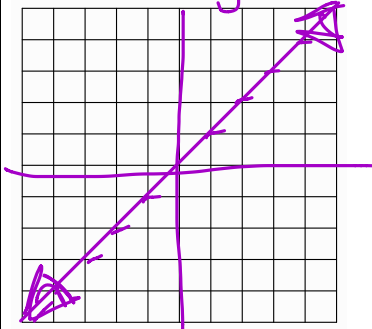
Quadratic  
 Explicit equation:  
 $y = x^2 + 5$   
 Recursive equation:

10. Graph the functions from the tables in #8 and #9. Add any additional characteristics you notice from the graph. Place your axes so that you can show all 5 points. Identify your scale. Write your explicit equation above the graph.

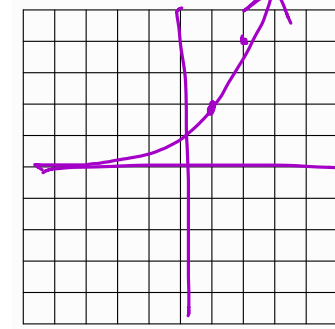
a. Equation:



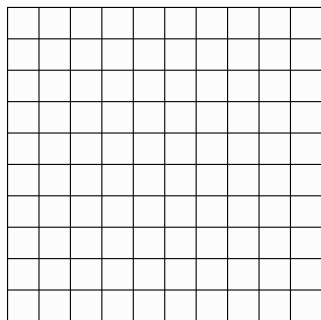
b. Equation:



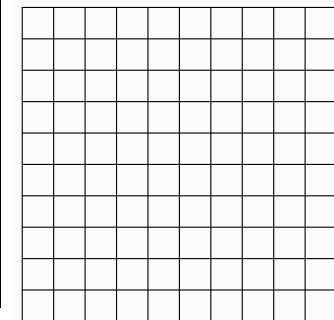
c. Equation:



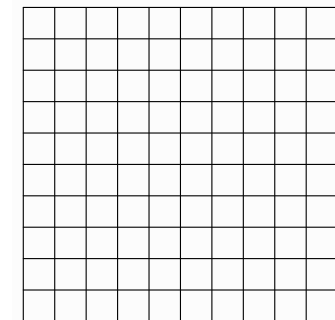
d. Equation:



e. Equation:



f. Equation:



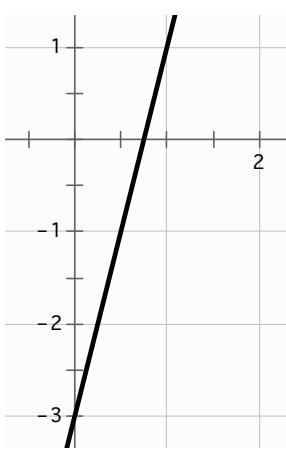
Slope  $\frac{y_2 - y_1}{x_2 - x_1}$

**GO**

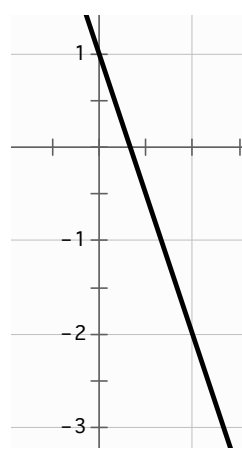
Topic: Rates of Change

Identify the rate of change in each of the representations below.

11.



12.



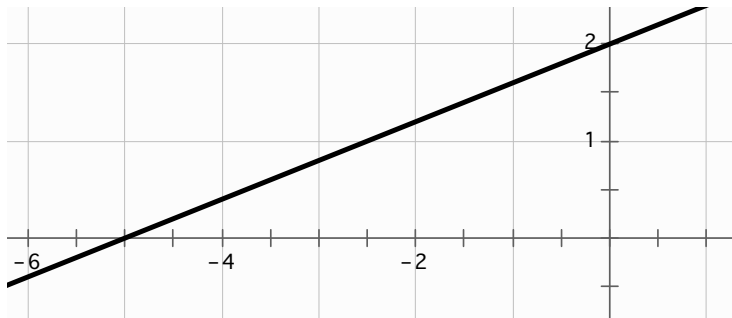
13.

x	f(x)
25	65
26	68
27	71
28	74

14.

$f(0) = 7; f(n + 1) = f(n) + 5$

15.



16.

Slope of  $\overrightarrow{AB}$   
 $A(-3, 12) B(-11, -16)$

17. George is loading freight into an elevator. He notices that the weight limit for the elevator is 1000 lbs. He knows that he weighs 210 lbs. He has loaded 15 boxes into the elevator. Each box weighs 50 lbs. Identify the rate of change for this situation.

18.

Independent variable	4	5	6	7	8
Dependent variable	5	5.5	6	6.5	7

19.

$f(-4) = 24$  and  $f(6) = -36$

READY, SET, GO!

Name

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**READY**

Topic: Multiplying two binomials

In the previous RSG, you were asked to use the distributive property on two different terms in the same problem. Example: *Multiply and simplify*  $3x(4x + 1) + 2(4x + 1)$ .

You may have noticed that the binomial  $(4x + 1)$  occurred twice in the problem.

Here is a simpler way to write the same problem:  $(3x + 2)(4x + 1)$ .

You will use the distributive property twice. First multiply  $3x(4x + 1)$ ; then multiply  $+2(4x + 1)$ . Add the like terms. Write the  $x^2$  term first, the  $x$ -term second, and the constant term last.

$$3x(4x + 1) + 2(4x + 1) \rightarrow (12x^2 + 3x) + (8x + 2) \rightarrow 12x^2 + \underbrace{[3x + 8x]}_{\text{like terms}} + 2 \rightarrow \underbrace{12x^2 + 11x + 2}_{\text{Simplified form}}$$

**Multiply the two binomials.** (Your answer should have 3 terms and be in this form  $ax^2 + bx + c$ .)

1.  $(x + 5)(x - 7)$
2.  $(x + 8)(x + 3)$
3.  $(x - 9)(x - 4)$
4.  $(x + 1)(x - 4)$
5.  $(3x - 5)(x - 1)$
6.  $(5x - 7)(3x + 1)$
7.  $(4x - 2)(8x + 10)$
8.  $(x + 6)(-2x + 5)$
9.  $(8x - 3)(2x - 1)$

1.3 set HW

**SET**

Topic: Distinguishing between linear and quadratic patterns

**Use first and second differences to identify the pattern in the tables as linear, quadratic, or neither. Write the recursive equation for the patterns that are linear or quadratic.**

10.

x	y
-3	-23
-2	-17
-1	-11
0	-5
1	1
2	7
3	13

- a. Pattern:
- b. Recursive equation:

11.

x	y
-3	4
-2	0
-1	-2
0	-2
1	0
2	4
3	10

- a. Pattern:
- b. Recursive equation:

12.

x	y
-3	-15
-2	-10
-1	-5
0	0
1	5
2	10
3	15

- a. Pattern:
- b. Recursive equation:

13.

x	y
-3	24
-2	22
-1	20
0	18
1	16
2	14
3	12

- a. Pattern:  
 b. Recursive equation:

14.

x	y
-3	48
-2	22
-1	6
0	0
1	4
2	18
3	42

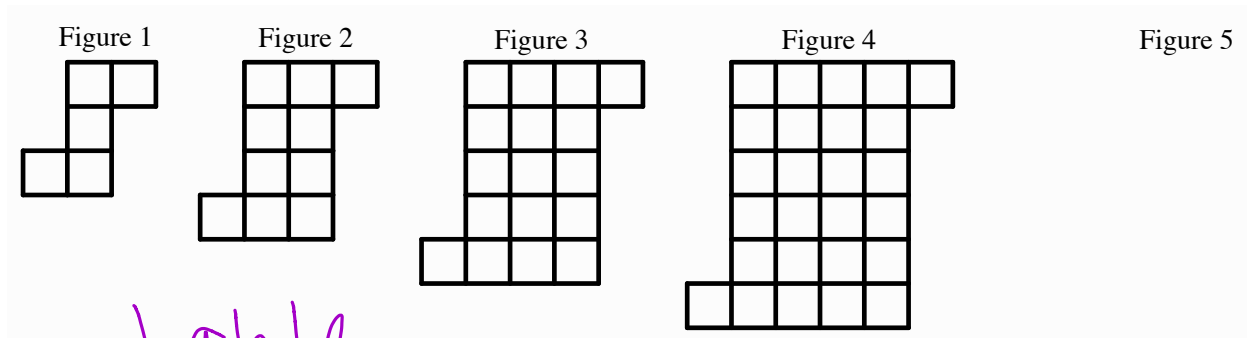
- a. Pattern:  
 b. Recursive equation:

15.

x	y
-3	4
-2	1
-1	0
0	1
1	4
2	9
3	16

- a. Pattern:  
 b. Recursive equation:

16.



table

- a. Draw figure 5.  
 b. Predict the number of squares in figure 30. Show what you did to get your prediction.

**GO**

Topic: Interpreting recursive equations to write a sequence

**Write the first five terms of the sequence.**

17.  $f(0) = -5; f(n) = f(n - 1) + 8$

18.  $f(0) = 24; f(n) = f(n - 1) - 5$

19.  $f(0) = 25; f(n) = 3f(n - 1)$

20.  $f(0) = 6; f(n) = 2f(n - 1)$

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**READY**

Topic: Applying slope formula

Calculate the slope of the line between the given points. Use your answer to indicate which line is the steepest.

1. A (-3, 7) B (-5, 17)

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{17 - 7}{-5 - (-3)} = \frac{10}{-2} = -5$$

2. H (12, -37) K (4, -3)

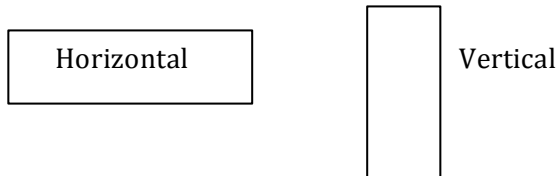
3. P (-11, -24) Q (21, 40)

4. R (55, -75) W(-15, -40)

**SET**

Topic: Investigating perimeters and areas

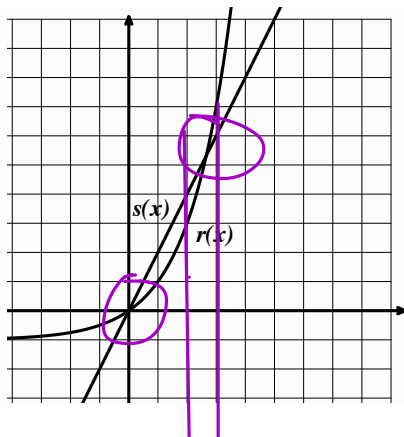
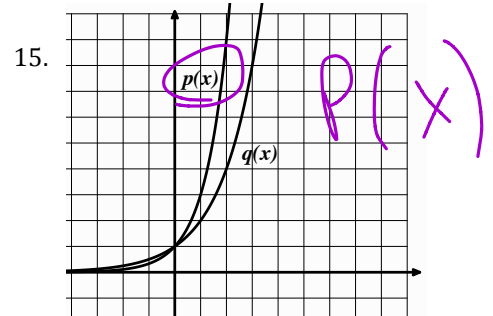
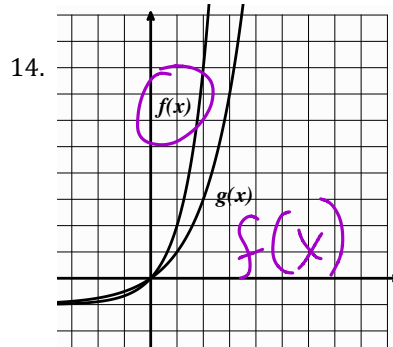
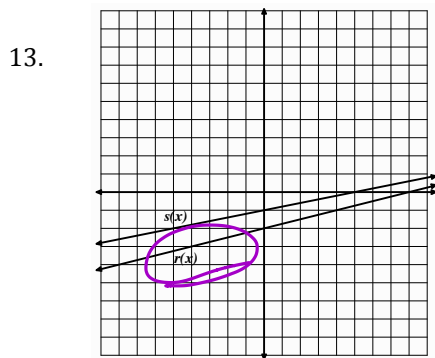
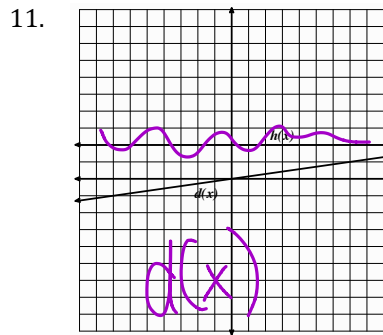
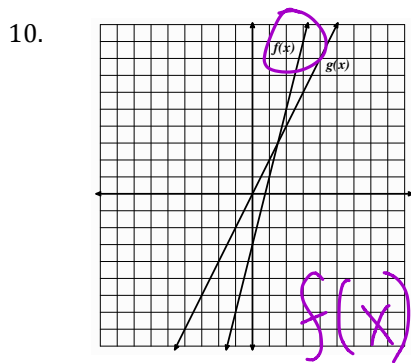
Adam and his brother are responsible for feeding their horses. In the spring and summer the horses graze in an unfenced pasture. The brothers have erected a portable fence to corral the horses in a grazing area. Each day the horses eat all of the grass inside the fence. Then the boys move it to a new area where the grass is long and green. The porta-fence consists of 16 separate pieces of fencing each 10 feet long. The brothers have always arranged the fence in a long rectangle with one length of fence on each end and 7 pieces on each side making the grazing area 700 sq. ft. Adam has learned in his math class that a rectangle can have the same perimeter but different areas. He is beginning to wonder if he can make his daily job easier by rearranging the fence so that the horses have a bigger grazing area. He begins by making a table of values. He lists all of the possible areas of a rectangle with a perimeter of 160 ft., while keeping in mind that he is restricted by the lengths of his fencing units. He realizes that a rectangle that is oriented horizontally in the pasture will cover a different section of grass than one that is oriented vertically. So he is considering the two rectangles as different in his table. Use this information to answer questions 5 – 9 on the next page.



GO

Topic: Comparing linear and exponential rates of change

Indicate which function is changing faster.



16 a. Examine the graph at the left from 0 to 1.

Which graph do you think is growing faster?

$s(x)$

b. Now look at the graph from 2 to 3.

Which graph is growing faster in this interval?

$r(x)$