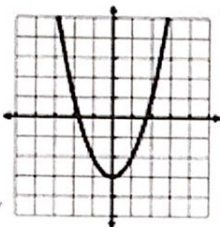


Unit 8 Review

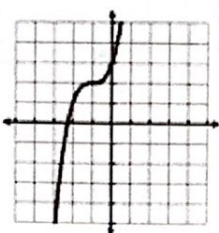
For problems 1-12, decide if the functions are even, odd, or neither.

1.



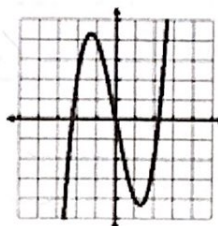
E

2.



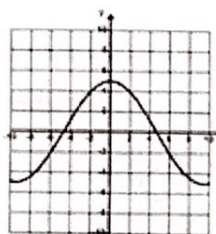
N

3.



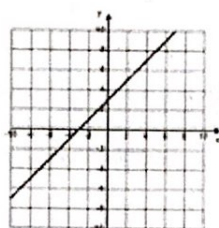
O

4.



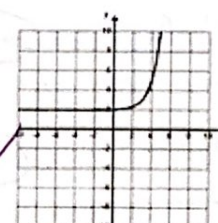
E

5.



N

6.



N

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

N

8. $f(x) = -x^3 + 2x$

O

9. $f(x) = x^3 + 4x + 1x^0$

N

10. $f(x) = \frac{1}{2}x^2 + 9x^0$

E

11. $f(x) = 5x^1 + 1x^6$

N

12. $f(x) = 5x^0$

E

Fill in the chart describing the differences in each type of function.

Name of Function	Equation	Key characteristics	Sketch of the graph
Linear	$y = mx + b$		
Quadratic	$y = ax^2 + bx + c$		
Exponential	$y = a \cdot b^x$		

Identify the following equations as linear, quadratic or exponential.

1. $y = 10\left(\frac{1}{3}\right)^x$ Σ	2. $y = 5 + 7(x)$ L
3. $y = (x + 3)^2 - 4$ Q	4. $y = -2(x) + 5$ L
5. $y = -\frac{1}{2}(3)^x$ Σ	6. $y = \frac{1}{3}(x)^2 - 4$ Q
7. $y = 4^x + 6$ Σ	8. $y = -\frac{3}{2}x - 3$ L
9. $y = x^2 - 5x + 6$ Q	10. $f(x) = (x - 2)^2 + 7$ Q

1. Look at the following tables and decide if they represent a linear, exponential, or quadratic function.

x	y
-4	5
-3	8
-2	13
-1	20
0	29
1	40

$\begin{matrix} 3 \\ 5 \\ 7 \\ 9 \\ 11 \end{matrix} \begin{matrix} > 2 \\ > 2 \\ > 2 \\ > 2 \\ > 2 \end{matrix}$ Quad

x	y
-5	32
-4	16
-3	8
-2	4
-1	2
0	1

$\begin{matrix} -16 \\ -8 \\ -4 \\ -2 \\ -1 \end{matrix} \begin{matrix} > \times 8 \\ > 4 \\ > 2 \\ > 2 \\ > 1 \end{matrix}$ Expo

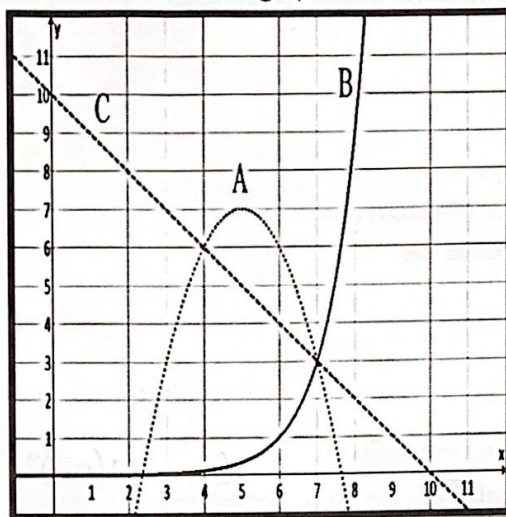
x	y
-2	-2.75
0	-2
2	1
4	13
6	61
8	253

$\begin{matrix} 0.75 \\ 3 \\ 12 \\ 48 \\ 192 \end{matrix} \begin{matrix} > 2.25 \\ > 9 \\ > 36 \\ > 144 \end{matrix}$ Expo

x	y
0.5	0.9
0.75	1.1
1	1.3
1.25	1.5
1.5	1.7
1.75	1.9

$\begin{matrix} 0.2 \\ 0.2 \\ 0.2 \\ 0.2 \\ 0.2 \end{matrix}$ Linear

Use the following graph to answer the following questions:



Which function is linear? Exponential? Quadratic?

C B A

List the functions in order from smallest to largest based on x-intercepts:

A, A, C

List the functions in order from smallest to largest based on y-intercepts:

A, B, C

List the functions in order from smallest to largest when $x = 2$:

A, B, C

List the functions in order from smallest to largest when $x = 5$:

B, C, A

List the functions in order from smallest to largest when $x = 9$:

A, C, B

List the functions in order from smallest to largest when $x = 15$:

A, C, B

Which functions have a positive rate of change through the entire graph?

B

Which functions have a negative rate of change through the entire graph?

C

Which function has a rate of change that can be both positive and negative?

A

Which functions go towards negative infinity as x goes towards infinity?

A, C

Which functions go towards positive infinity as x goes towards infinity?

B

Unit 8.2 Arithmetic and Geometric Sequences Review:

Arithmetic Sequences:

For questions 1-4

1. Give the next 3 terms.
2. Write the **CLOSED (EXPLICIT)** rule
3. Write the **RECURSIVE** rule
4. Find a_{12}

1. 10, 11, 12, 13, ... 14, 15, 16

$$a_n = 10 + (n-1)1 \quad a_1 = 10$$

$$a_n = a_{n-1} + 1$$

$$a_{12} = 21$$

2. -1, 3, 7, 11, ... 15, 19, 23

$$a_n = -1 + (n-1)4 \quad a_1 = -1$$

$$a_n = a_{n-1} + 4$$

$$a_{12} = 43$$

3. 1024, 512, 0, -512, ... -1024, -1536, -2048

$$a_n = 1024 + (n-1)(-512) \quad a_1 = 1024$$

$$a_n = a_{n-1} - 512$$

$$a_{12} = -4608$$

4. 35, -15, -65, -115, ... -165, -215, -265

$$a_n = 35 + (n-1)(-50) \quad a_1 = 35$$

$$a_n = a_{n-1} - 50$$

For problems 6-10, determine whether the following are arithmetic sequences of ~~arithmetic~~ sequences. Then list the first 4 terms of the sequence.

5. $a_1 = 99$
 $a_n = a_{n-1} - 10$

$$99, 89, 79, 69$$

8. $a_n = -2(n-1) - 51$

$$-51, -53, -55, -57$$

9. $a_n = -4 + (n-1)$

$$-4, -3, -2, -1$$

10. $a_1 = 13$
 $a_n = a_{n-1} + 12$

$$13, 25, 37, 49$$

11. Count the number of lines creating each figure and answer the questions below:

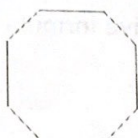


Fig 1

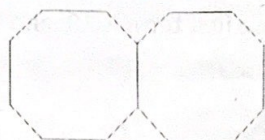


Fig 2

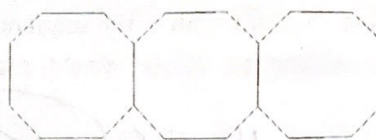


Fig 3

Complete the table below:

Fig #	0	1	2	3	4	5
# of lines	1	8	15	22	29	36

- a. Write the **CLOSED (EXPLICIT)** and **RECURSIVE** rule for the number of lines needed to generate each shape.

$$a_n = 1 + (n-1)7$$

$$a_1 = 1$$

$$a_n = a_{n-1} + 7$$

- b. How many lines would be used to create figure #20?

134

12. Two terms of an arithmetic sequence are $a_5 = 15$ and $a_6 = 22$.

- a. What is the common difference?

+7

- b. What are the first four terms of this sequence?

-6, 1, 8, 15

- c. Write the **CLOSED (EXPLICIT)** and **RECURSIVE** rules for this sequence.

$$a_n = -6 + (n-1)7$$

$$a_1 = -6$$

$$a_n = a_{n-1} + 7$$

x	1	2	3	4	5
y	-6	1	8	15	22

Geometric Sequences

1. Find the **third** term of the sequence whose first term is 10, and the **recursive** formula is

$$a_n = 15(a_{n-1}).$$

$$10, 150, 2250$$

2. Write the **Explicit (closed)** Formula, and then find the ¹²~~20~~th term of the sequence 3, 12, 48, 192, ...

$$a_n = 3 \cdot 4^{n-1}$$

~~$$a_n = 125, 829, 12$$~~

$$a_{12} = 125, 829, 12$$

3. Write both the explicit (closed) and recursive formula for the following sequence: 42, 336, 2688, ...

$$a_n = 42 \cdot 8^{n-1}$$

$$a_1 = 42$$

$$a_n = 8(a_{n-1})$$

4. Write both the explicit (closed) and recursive formula for the following sequence: 1250, 250, 50, ...

$$a_n = 1250 \left(\frac{1}{5}\right)^{n-1}$$

$$a_1 = 1250$$

$$a_n = \frac{1}{5}(a_{n-1})$$

5. Write the explicit (closed) and recursive formula for a geometric sequence whose 6th term is 4 and the 7th term is 2.

$$a_n = 128 \left(\frac{1}{2}\right)^{n-1}$$

$$a_1 = 128$$

$$a_n = \left(\frac{1}{2}\right)(a_{n-1})$$

1	2	3	4	5	6	7
128	64	32	16	8	4	2

6. Write a rule to find the n th term of a sequence whose first term is 12 and the rate is 15.

$$a_n = 12 \cdot 15^{n-1}$$

7. Find the 17th term of the sequence -2, -8, -32, ...

$$a_n = -2 \cdot 4^{n-1}$$

$$a_{17} = -858, 993, 4592$$