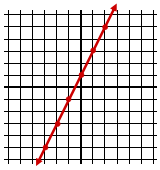
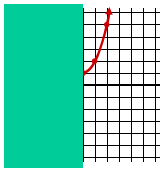
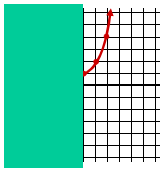
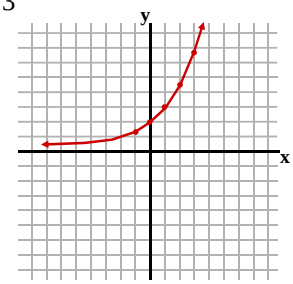
Lesson 11-9

Objective - To determine whether a relationship is linear, quadratic or exponential from a data set

Linear	Quadratic	Exponential
$y = mx + b$	$y = ax^2 + bx + c$	$y = ab^x$
$y = 2x + 1$	$y = x^2 + 1$	$y = 2^x$
		
Constant Slope	Slope changes	Slope changes

Graph the set of data to determine the type of relationship.

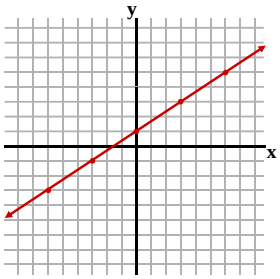
1) $(-1, 1\frac{1}{3})$ (0, 2) (1, 3) (2, 4.5) (3, 6.75)



Exponential

Graph the set of data to determine the type of relationship.

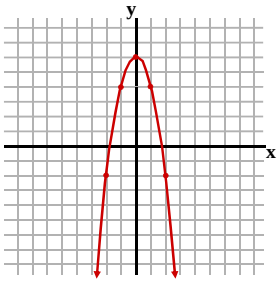
2) (-6, -3) (-3, -1) (0, 1) (3, 3) (6, 5)



Linear

Graph the set of data to determine the type of relationship.

3) (-2, -2) (-1, 4) (0, 6) (1, 4) (2, -2)



Quadratic

Look for a Pattern

1)

x	y	
-1	-1	
0	1	+2
1	3	+2
2	5	+2
3	7	+2
	+1	

Constant Difference

$m = \frac{\Delta y}{\Delta x} = \frac{+2}{+1}$

Linear

2)

x	y	
-1	1	
0	0	-1
1	1	+1
2	4	+3
3	9	+5
	+1	+2

Constant Difference in 2nd Round

Quadratic

3)

x	y	
-1	$\frac{1}{2}$	
0	1	×2
1	2	×2
2	4	×2
3	8	×2
	+1	

Common Ratio

Exponential

Identify the type of relationship represented by the data.

4)

x	y	
-2	6	
-1	3	-3
0	2	-1
1	3	+1
2	6	+3
3	11	+5
	+1	+2

Constant Difference in 2nd Round

Quadratic

Lesson 11-9 (cont.)

Identify the type of relationship represented by the data.

5)

x	y
-6	0
-4	1
-2	2
0	3
2	4
4	5

(+2, +2, +2, +2, +2; +1, +1, +1, +1, +1)

Constant Difference

$m = \frac{\Delta y}{\Delta x} = \frac{+1}{+2}$

Linear

Identify the type of relationship represented by the data.

6)

x	y	
0	25	
1	20	$\frac{20}{25} = 0.8$
2	16	$\frac{16}{20} = 0.8$
3	12.8	$\frac{12.8}{16} = 0.8$
4	10.24	$\frac{10.24}{12.8} = 0.8$

(+1, +1, +1, +1)

x = Common Difference

y = Common Ratio

Exponential

Identify the type of relationship represented by the data. Challenge!

7)

x	y
1	20
2	18
4	14
8	6

(+1, +2, +4; -2, -4, -4; -2, -4)

No Constant Difference in 2nd Round

Identify the type of relationship represented by the data. Challenge!

7)

x	y	
1	20	
2	18	-2
4	14	-4
8	6	-8

(+1, +2, +4)

$m = \frac{\Delta y}{\Delta x} = \frac{-2}{+1} = -2$

$m = \frac{\Delta y}{\Delta x} = \frac{-4}{+2} = -2$

$m = \frac{\Delta y}{\Delta x} = \frac{-8}{+4} = -2$

Linear