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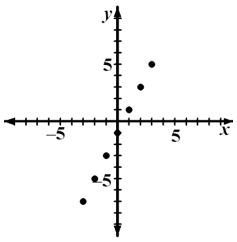
Part A: Determining Type of Equation

Examples

Based on each table, identify the shape of the graph.

Example 1

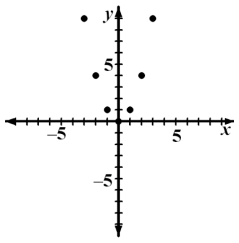
x	−3	−2	−1	0	1	2	3
y	−7	−5	−3	−1	1	3	5
		2	2	2	2	2	2



The difference in y-values is always two, a constant. The graph is linear and is verified at right.

Example 2

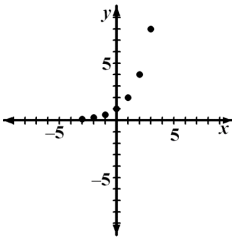
x	−3	−2	−1	0	1	2	3
y	9	4	1	0	1	4	9
		−5	−3	−1	1	3	5
			2	2	2	2	2



The first difference in y-values is not constant but the second difference is. The graph is quadratic and is verified at right.

Example 3

x	−3	−2	−1	0	1	2	3
y	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4	8
		$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4



The difference in y-values follows a pattern similar to the y-values. The graph is exponential and is verified at right. (In this case, the difference pattern was exactly the same as the y-values. This is not always necessary.)

DIRECTIONS:

1. Determine if each of the data sets below are **linear, quadratic, or exponential**.
2. **IF EXPONENTIAL:** Use exponential regression to determine the equation.

1.

x	−3	−2	−1	0	1	2	3
y	14	10	6	2	−2	−6	−10

2.

x	−3	−2	−1	0	1	2	3
y	$\frac{1}{2}$	1	2	4	8	16	32

3.

x	−3	−2	−1	0	1	2	3
y	21	12	5	0	−3	−4	−3

4.

x	−3	−2	−1	0	1	2	3
y	−16	−13	−10	−7	−4	−1	2

5.

x	−3	−2	−1	0	1	2	3
y	4	8	16	32	64	128	256

6.

x	−3	−2	−1	0	1	2	3
y	$\frac{1}{27}$	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9	27

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Part B: Exponential Equation from Two Data Points

Directions: Write exponential equations for each pair of points. (Hint: label x1, y1, x2, y2)

1. (0, 6), (1, 15)
2. (1, 55), (0, 5)
3. (0, 500), (1, 150)
4. (1, 0.2), (0, 20)
5. (-1, 12), (0, 3)
6. (0, 1500), (1, 1800)

Part C: Continuously Compounded Interest

$$A(t) = Pe^{rt}$$

1. An amount of $1,240.00 is deposited in a bank paying an annual interest rate of 2.85 %, compounded continuously. Find the balance after 2½ years.

2. An amount of $2,340.00 is deposited in a bank paying an annual interest rate of 3.1%, compounded continuously. Find the balance after 3 years.

3. An amount of $2,000.00 is deposited in a bank paying an annual interest rate of 2.85 %, compounded continuously.
(a) Find the balance after 3 years.

(b) How long would it take for the money to double?

4. If Matt puts $3000 into an account the pays 4.3% interest compounded continuously for 7 years how much will he have after 7 years?

5. Bailey has $10,000 to put into a bank account where the interest rate is 6.7% compounded continuously. How long must she keep the money in the bank so that the principal doubles?