

Taking risks is how we grow.

1. Jenna is planning to swim in a charity swim-a-thon. Several relatives said they would sponsor her. Each of their donations is explained. Complete a table for each donation plan.

**Grandmother:** I will give you \$1 if you swim 1 lap, \$3 if you swim 2 laps, \$5 if you swim 3 laps, \$7 if you swim 4 laps, and so on.

Laps	1	2	3	4	5	... 20 laps	n laps (explicit equation)
Donation							

**Mother:** I will pay \$1 if you swim 1 lap, \$3 if you swim 2 laps, \$9 if you swim 3 laps, \$27 if you swim 4 laps, and so on.

Laps	1	2	3	4	5	... 20 laps	n laps (explicit equation)
Donation							

**Aunt Lori:** I will pay \$2 if you swim 1 lap, \$3.50 if you swim 2 laps, \$5 if you swim 3 laps, \$6.50 for 4 laps, and so on.

Laps	1	2	3	4	5	... 20 laps	n laps (explicit equation)
Donation							

**Uncle Jack:** I will give you \$1 if you swim 1 lap, \$2 if you swim 2 laps, \$4 if you swim 3 laps, \$8 if you swim 4 laps, and so on.

Laps	1	2	3	4	5	... 20 laps	n laps (explicit equation)
Donation							

2. Decide whether each donation pattern is *exponential*, *linear*, or *neither*.

**Grandmother:**

**Mother:**

**Aunt Lori:**

**Uncle Jack:**

Evaluate the following equations, when  $x = \{1, 2, 3, 4, 5\}$ . Organize your inputs and outputs into a table of values for each equation. Let  $x$  be the input and  $g(x)$  be the output.

3.  $g(x) = 4^x$

4.  $g(x) = (-3)^x$

5.  $g(x) = -3^x$

6.  $g(x) = 10^x$

x	g(x)

x	g(x)

x	g(x)

x	g(x)

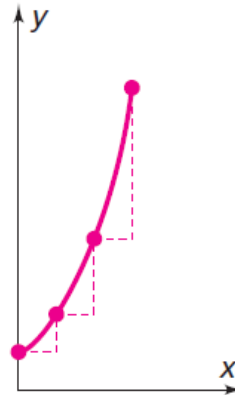
7. The graphs at right represent  $y = 2^x$  and  $y = 2x + 1$ .

a. Which graph shows linear growth?

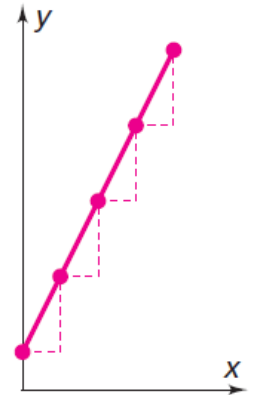
How do you know when a graph is linear?

b. Which graph shows exponential growth?

How do you know?



Graph 1



Graph 2

Study the pattern in each table and answer questions a and b.

8.

x	0	1	2	3	4	5
Y	10	12.5	15	17.5	20	22.5

a. *linear, exponential, or neither.* Explain your reasoning.

b. If the relationship is linear or exponential, give its explicit equation.

c. Write at least three more explicit equations for this pattern.

9.

x	0	1	2	3	4
Y	1	6	36	216	1296

a. *linear, exponential, or neither.* Explain your reasoning.

b. If the relationship is linear or exponential, give its explicit equation.

10.  $f(x) = x^2$

a. *linear, exponential, or neither.* Explain your reasoning.

b. List the first 5 terms.

11.  $f(x) = 2(2)^x$

a. *linear, exponential, or neither.* Explain your reasoning.

b. List the first 5 terms.

