Name: _____ Date: _____ Period: _____ Score: _____

**Unit 3 Growing, Growing, Growing #3 Assignment**

**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 give you $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 give you $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) |
|---|---|
| | |
| | |
| | |
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| | |

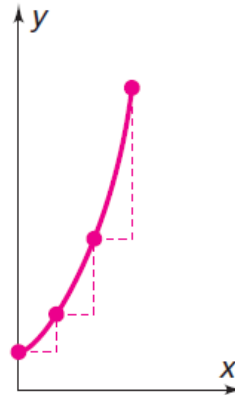| x | g(x) |
|---|---|
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| | |

| x | g(x) |
|---|---|
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| | |
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| | |

7. The graphs at right represent $y = 2^x$ and $y = 2x + 1$.
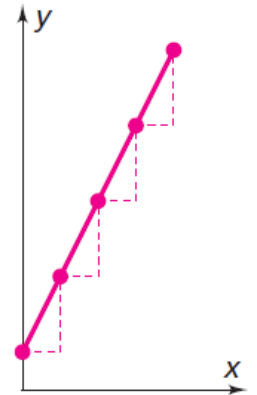**a.** Which graph shows linear growth?
How do you know when a graph is linear?

**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.