Write

Explain why you might need to repeat steps in the Modeling Process.

Remember

The 4 steps of the mathematical modeling process are:

1. Notice and Wonder
2. Organize and Mathematize
3. Predict and Analyze
4. Test and Interpret

Practice

Visit **livehint.com/texas** or use this QR code if you need a hint on the Practice questions.

1. Triplets seem to run in the Tribiani family. Great-grandma Tribiani had triplets, each of her triplets had triplets and each of those triplets had triplets.
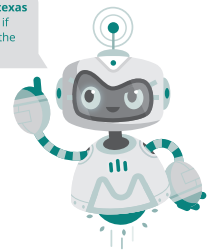
Step 1: Notice and Wonder

    a. What do you notice about the situation?

    b. Which of these is a mathematical question you can ask about the situation?

- Can triplets be represented by a function?
- How many children did Great-grandma Tribiani's siblings have?
- Is there a relationship between the generation and the number of triplets in that generation?

Step 2: Organize and Mathematize

    c. Represent the number of triplets in each generation as a numeric sequence with 4 terms. Then describe the sequence.

    d. Create a table of values using the first 4 terms of the sequence.

Step 3: Predict and Analyze

    e. Write an explicit formula to represent this sequence.

    f. Create a graph for the explicit formula you built.
Describe the characteristics of the graph in terms of the situation.

    g. Predict the number of descendants in the Tribiani family in 20 generations. Show your work.

Step 4: Test and Interpret

    h. Determine whether a discrete or continuous graph makes more sense in this scenario. Explain your reasoning.

Stretch

Aaron just paid $7.40 for a new pair of sunglasses. His father told him that prices were different 10 years ago. Then his grandfather told him that 20 years ago, prices were even better. Aaron did some research and found that the prices did change, but not by much. Ten years ago, the average price for a generic pair of sunglasses was $6.80, and 20 years ago it was $6.20.

1. Describe a possible arithmetic relationship between the decade and the price in that decade. Represent the relationship with a table, an explicit formula, and a graph. Describe the characteristics of each.

2. Describe a possible geometric relationship between the decade and the price in that decade. Represent the relationship with a table, an explicit formula, and a graph. Describe the characteristics of each.

3. Predict the price of a pair of sunglasses in 5 decades using both sequences.

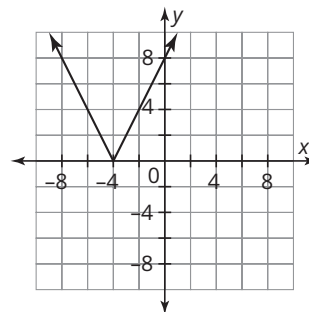4. Which type of sequence better represents the situation? Explain your reason.

Review

1. Determine the 58th term of the sequence 540, 495, 450, . . .

2. Determine the 13th term of the sequence 0.4, −1.2, 3.6, . . .

3. Each pair of graphs has been grouped together. Use characteristics of the graphs to explain why they were likely grouped together.
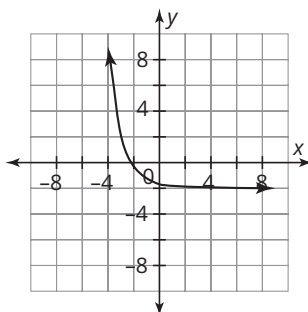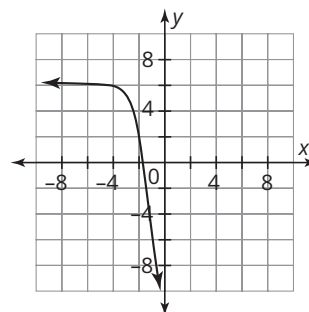
a.

Graph A
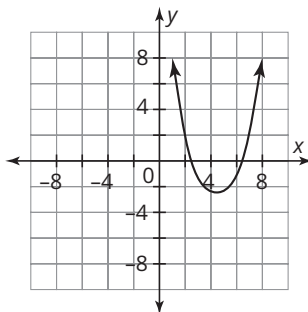
Graph B

b.

Graph A

Graph B

4. Determine the function family to which each equation belongs. Explain your reasoning.

a. $f(x) = 4 \cdot 9^x + 2$

b. $g(x) = 8x - 3$