

## UNIT 4 • MODELING AND ANALYZING EXPONENTIAL FUNCTIONS

## Lesson 7: Building Functions From Context

## Practice 4.7.1: Building Functions from Context

A

Write an explicit function to represent each pattern.

1. Yuki tracks the number of people who watch his new video online. After 1, 2, 3, and 4 months, the video had 6, 36, 216, and 1,296 views, respectively.
2. Azu puts a bowl of warm water in the freezer and measures the water temperature each minute. At 0 minutes, the water is  $80^{\circ}\text{F}$ . After 1, 2, and 3 minutes, the temperature is  $68^{\circ}\text{F}$ ,  $57.8^{\circ}\text{F}$ , and  $49.13^{\circ}\text{F}$ , respectively.
3. The number of cells in a bacteria culture in a petri dish increases every hour. There were originally 43 bacteria cells. After 1, 2, and 3 hours, there were 86, 172, and 344 bacteria cells, respectively.
4. Cameron tracks the number of people who read his blog. In weeks 1, 2, 3, 4, and 5, the blog had 12, 60, 300, 1,500, and 7,500 visitors, respectively.
5. As a treat, Nia eats a portion of a chocolate bar each day. She eats the same portion of the remaining bar each day. On day 0, the bar of chocolate starts with 32 pieces. After 1 day, 16 pieces remain. After days 2, 3, and 4, there are a total of 8, 4, and 2 pieces remaining.
6. Assume the pattern in the following diagram continues. Describe the number of line segments in Figure  $x$ .

Figure 0



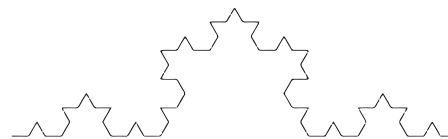
Figure 1



Figure 2



Figure 3

**continued**

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7. Given the diagram that follows, describe the number of blocks in Figure  $x$  if this pattern continues.

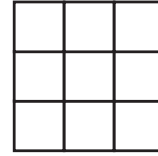
Figure 1



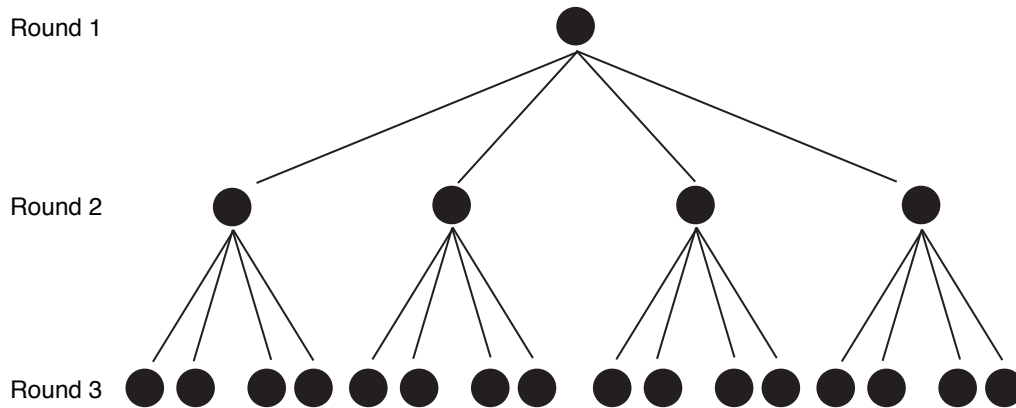
Figure 2



Figure 3



8. A rural school uses a phone tree to reach parents when the school is closed. Each parent calls multiple parents to notify them of the school closing. These parents then each call multiple parents, and so on. The following diagram shows the number of parents called after each round of calls. Each dot represents a parent. Find an explicit function to represent the number of parents called in any round  $x$ .



9. The number of members at a sports club is decreasing by 10% each year. There were originally 300 members. Find an explicit function to represent the number of members remaining at the end of each year.

10. The population of a city is growing. Each year, the population increases by approximately 10%, or 0.10 times the previous year's population. The population this year is 10,000. Find an explicit function to represent the population of the town in any year. Consider that year 0 is this year.