

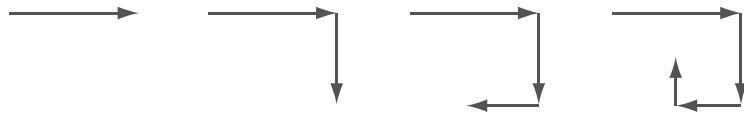
1-1 Reteaching

Patterns and Expressions

Identifying patterns is an important skill in algebra. Identify the underlying structure of a group of numbers, a set of data, or a sequence of figures to express a rule describing the relationship.

Problem

Look at the figures from left to right. What is the pattern? What would the next figure in the pattern look like?

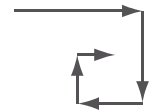


First, identify the basic properties of the figure. The number of elements in each figure increases by one from each figure to the next.

Second, determine whether the figures change in size. Notice that the arrows decrease in length by about $\frac{1}{3}$ at each step.

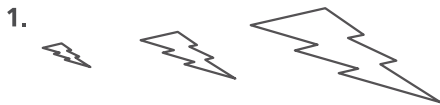
Third, observe whether there is displacement or rotation from one figure to the next. Each arrow is a 90° clockwise rotation from the previous arrow.

The pattern begins with an arrow pointing to the right. Each subsequent figure adds a new arrow that is shorter than the previous arrow by about $\frac{1}{3}$ and is rotated 90° clockwise from the previous one. The next figure in the pattern is shown at the right.

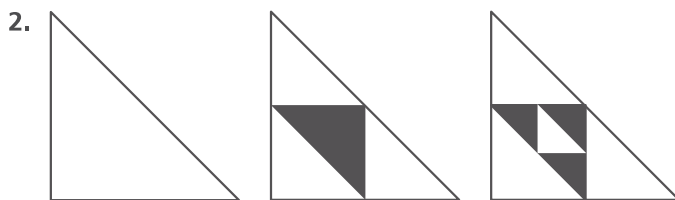
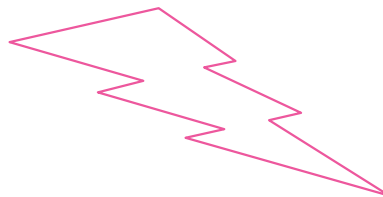


Exercises

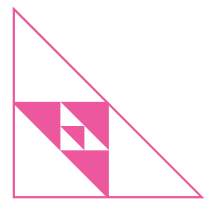
Describe the pattern in words and draw the next figure in the pattern.



Each figure is twice the size of the one before it.



Each figure adds a new triangle whose dimensions are 50% of the dimensions of the previous smallest triangle and is inside it, rotated 180° . The color alternates white to black from biggest to smallest triangle, respectively.



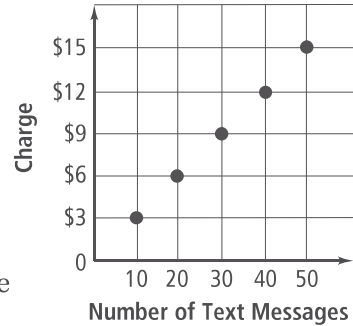
1-1 Reteaching (continued)

Patterns and Expressions

Problem

You tell your parents that you will pay the text messaging portion of your cell phone bill. The graph shows the monthly charge depending on the number of text messages you send and receive during the month. How much do you owe if you send and receive a total of 100 text messages during the month?

First, identify several points on the graph. Three points on the graph are (10, 3), (20, 6), and (50, 15). Make a table of values for the given inputs.



| Input | Process Column | Output |
|-------|--------------------|--------|
| 10 | $10 \times \$0.30$ | \$3 |
| 20 | $20 \times \$0.30$ | \$6 |
| 50 | $50 \times \$0.30$ | \$15 |

Identify the pattern in the process column. Each output is equal to the product of the input and \$.30. To summarize the result in words, each text message costs \$.30.

Therefore, if you send and receive 100 text messages during the month, then you owe $100 \times \$0.30 = \30 .

Exercises

Use the graph at the right to answer the questions.

- What is the cost to send 10 text messages? 20 text messages? 50 text messages? **\$5; \$10; \$25**
- What is the cost to send one text message? **\$.50**
- How much do you owe your parents if you send and receive 75 text messages during the month? **\$37.50**

