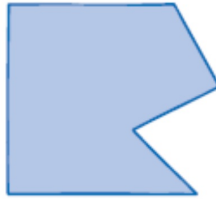


LAUNCH: In your notes (figure is on p. 294)

Trace this figure. Scale it using the given scale factors.
You can choose your own center of dilation.

- a. 2
- b. 0.5
- c. 1



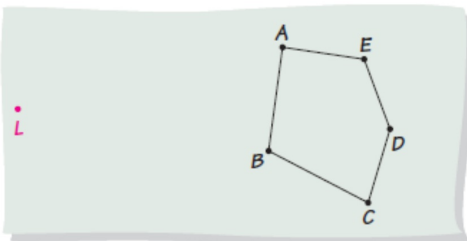
4.8 Ratio and Parallel Methods

Objective: Students will explain and contrast the ratio method and the parallel method for dilation

Example 1

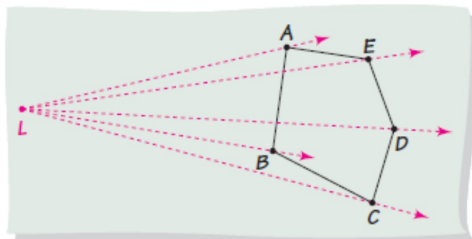
The Ratio Method

Problem Use point L as the center of dilation. Dilate polygon $ABCDE$ by $\frac{1}{2}$.

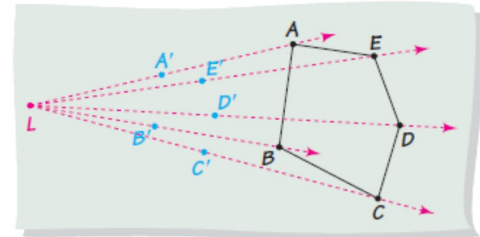


Solution

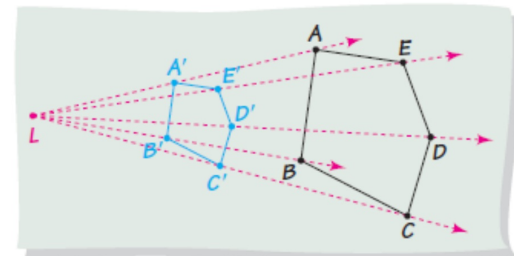
Step 1 Draw a ray from point L through each vertex of the polygon.



Step 2 Find the midpoint of each of the segments \overline{LA} through \overline{LE} .



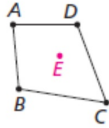
Step 3 Connect the midpoints to form a new polygon, $A'B'C'D'E'$.



Example 2

The Parallel Method

Problem Use point E as the center of dilation. Dilate polygon $ABCD$ by 2.

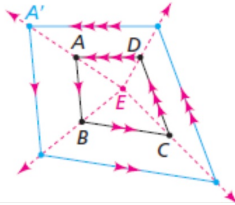


Solution

Step 1 Draw a ray from E through each vertex.

Step 2 Along one ray (\overrightarrow{EA} below), find a point that is twice as far from E as the vertex A . Mark this location A' .

Step 3 Start at point A' . Draw segments parallel to \overline{AB} , \overline{BC} , \overline{CD} , and finally \overline{DA} .



On Your Own

Page 299: 7-12

7. Draw a polygon. Use the parallel method to reduce the polygon by the factor $\frac{1}{2}$.
8. Draw a polygon. Use the parallel method to enlarge the polygon by the factor 3. Make three enlargements. Locate the centers of dilation inside the polygon, on the polygon, and outside the polygon.

9. Draw any polygon. Scale it by 2 using the ratio method. Let the center of dilation be as given.
 - a. outside the polygon
 - b. inside the polygon
 - c. on the polygon
 - d. Explain how the location of the center of dilation affects the scaled copy.
10. Draw a polygon. Make a scaled copy that shares a vertex with the original. Use any scale factor you like (other than 1).
11. Draw a polygon. Make a scaled copy that has one side containing the corresponding side of the original.

12. Julia scaled a polygon three times.
 - a. The first scaled copy was closer to the center of dilation than the original polygon. What can you say about the scale factor?
 - b. The second scaled copy was farther from the center of dilation than the original polygon. What can you say about the scale factor?
 - c. The third scaled copy was the same distance from the center of dilation as the original polygon. What can you say about the scale factor? Be careful!