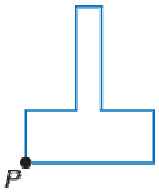
Lesson 8-7

Example 1

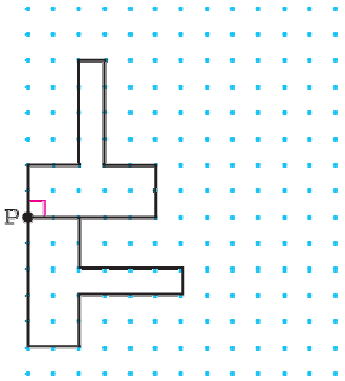
Draw the rotation image of this figure when it is turned 90° clockwise about a turn center, *P*.



Solution

Copy the figure onto grid or dot paper, labeling point P. Then trace the figure onto a sheet of paper. Hold your pencil point on the paper at point P. Turn the paper one-quarter turn, or 90°.

Remove the paper and copy the image onto the grid paper.



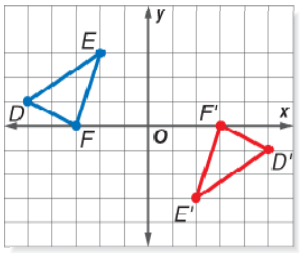
Example 2

Find the image of $\triangle DEF$ with vertices $D(-5, 1)$, $E(-2, 3)$, and $F(-3, 0)$ after a rotation of 180° counterclockwise about the origin.

Solution

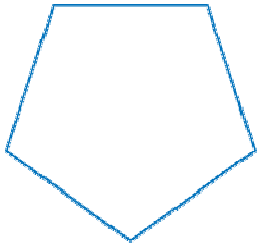
Multiply both the x-coordinate and the y-coordinate of each vertex by -1.

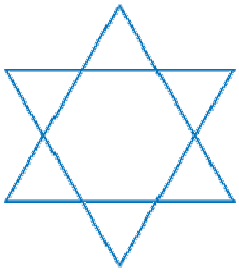
$D(-5, 1) \square D'(-5 \cdot (-1), 1 \cdot (-1)) \square D'(5, -1)$
$E(-2, 3) \square E'(-2 \cdot (-1), 3 \cdot (-1)) \square E'(2, -3)$
$F(-3, 0) \square F'(-3 \cdot (-1), 0 \cdot (-1)) \square F'(3, 0)$

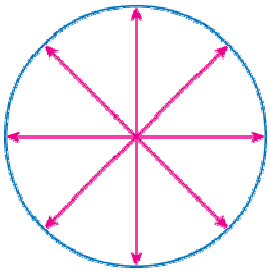


Example 3

Give the order of rotational symmetry for each figure.

a. 

b. 

c. 

Solution

a. The figure fits over its original position 5 times during a complete turn, so the order of rotational symmetry is 5.

b. The figure fits over its original position 6 times during a complete turn, so the order of rotational symmetry is 6.

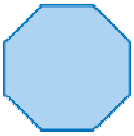
c. The figure fits over its original position 8 times during a complete turn, so the order of rotational symmetry is 8.

Example 4

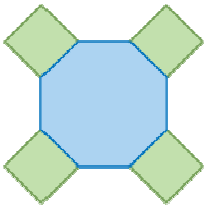
DESIGN A pattern for kitchen floor tiles uses only squares and regular octagons. There are no gaps or overlaps between the shapes. Construct the tessellation.

Solution

Step 1 Draw a regular octagon that will be the center of the pattern.



Step 2 Place squares on four sides of the octagon (every other side).



Step 3 Repeat the pattern by placing octagons next to other four sides of the octagon and then continue by adding more octagons and squares.