

**2.3 Rotations**

Name \_\_\_\_\_

Write the coordinates for the rotated image. Graph both figures. Connect the points in order.

1. Rotate  $90^\circ$  counterclockwise.

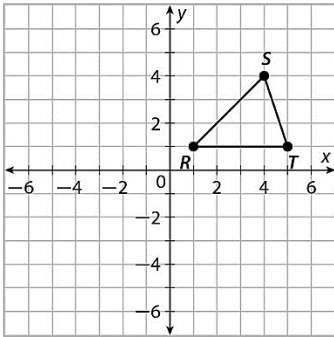
preimage	image
$A(-6, 2)$	$A' ( \quad , \quad )$
$B(-6, 4)$	$B' ( \quad , \quad )$
$C(-4, 4)$	$C' ( \quad , \quad )$
$D(-4, 5)$	$D' ( \quad , \quad )$
$E(-3, 3)$	$E' ( \quad , \quad )$
$F(-4, 1)$	$F' ( \quad , \quad )$
$G(-4, 2)$	$G' ( \quad , \quad )$

2. Rotate  $180^\circ$ .

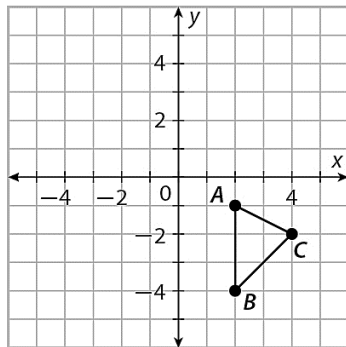
preimage	image
$A(-6, 2)$	$A' ( \quad , \quad )$
$B(-6, 4)$	$B' ( \quad , \quad )$
$C(-4, 4)$	$C' ( \quad , \quad )$
$D(-4, 5)$	$D' ( \quad , \quad )$
$E(-3, 3)$	$E' ( \quad , \quad )$
$F(-4, 1)$	$F' ( \quad , \quad )$
$G(-4, 2)$	$G' ( \quad , \quad )$

3. What clockwise rotation produces the same image as a counterclockwise rotation of  $220^\circ$ ? \_\_\_\_\_ $^\circ$

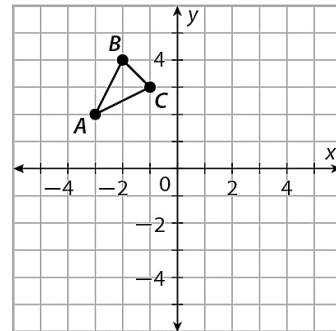
4. Graph  $\triangle RST$  after a rotation of  $90^\circ$



5. Graph  $\triangle ABC$  after a rotation of  $180^\circ$



6. Graph  $\triangle ABC$  after a rotation of  $270^\circ$



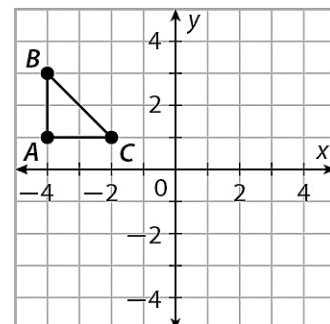
7. In which quadrant will the image of  $\triangle ABC$  lie after a counterclockwise rotation of  $1980^\circ$ ? Explain how you made your prediction.

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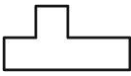
## 2.4 Symmetry

A pentomino is a figure made by joining five congruent squares side to side.


For Problems 1–4, identify if the pentomino has line symmetry. If yes, draw all lines of symmetry

1.  Does it have line symmetry?

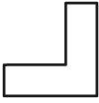
\_\_\_\_\_

2.  Does it have line symmetry?

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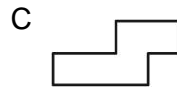
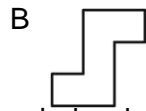
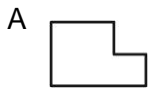
3.  Does it have line symmetry?

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4.  Does it have line symmetry?

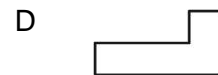
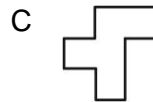
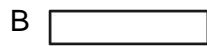
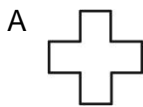
\_\_\_\_\_

5. Which of the pentominoes below is the only one that has rotational symmetry? \_\_\_\_\_

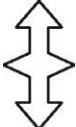


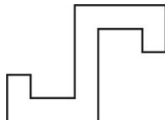
6. Which two pentominoes below have *both* line symmetry and rotational symmetry?

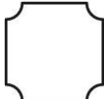
\_\_\_\_\_ and \_\_\_\_\_

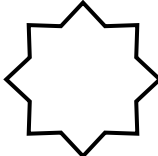


For 7-10, draw all lines of symmetry and tell if it has rotational symmetry. If so, give the angle.

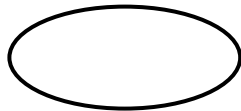
7.  Line: \_\_\_\_\_  
Rotational: \_\_\_\_\_

9.  Line: \_\_\_\_\_  
Rotational: \_\_\_\_\_

8.  Line: \_\_\_\_\_  
Rotational: \_\_\_\_\_

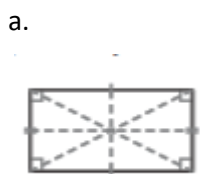
10.  Line: \_\_\_\_\_  
Rotational: \_\_\_\_\_

11. How is a rectangle similar to an ellipse? Use concepts of symmetry in your answer.



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12. Explain the error. A student was asked to draw all the lines of symmetry on the figures shown. Identify the student's work as correct or incorrect. If incorrect, explain why.



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