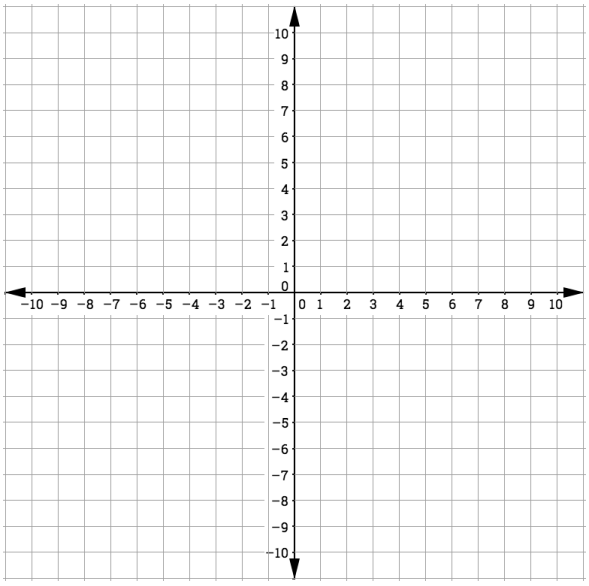
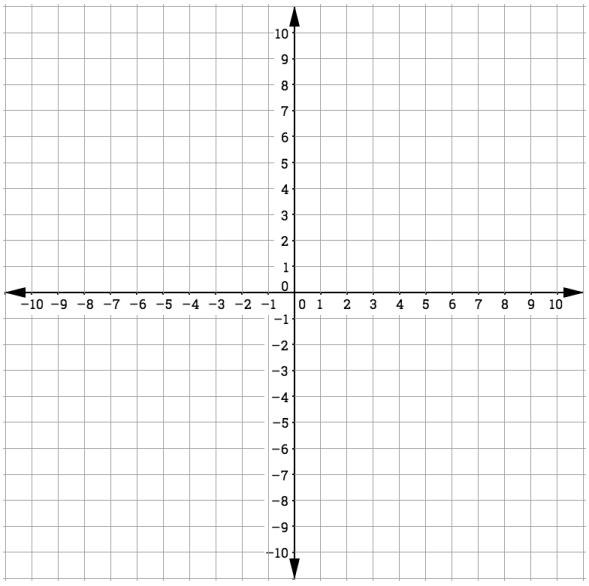
Name _____ Date_____

Introduction to Polygons – Part 2
Symmetries of Regular Polygons
Independent Practice

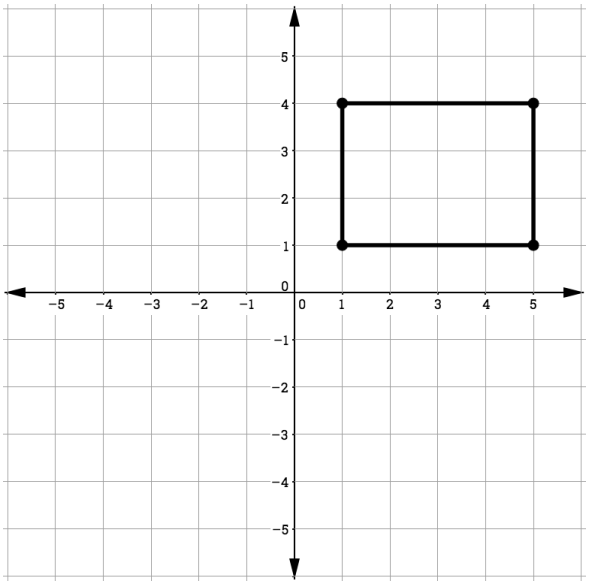
1. Sketch an examples of a symmetrical polygon. Explain why it is symmetrical.



2. Sketch an example of an asymmetrical polygon. Explain why it is *not* symmetrical.



3. Consider the rectangle below.



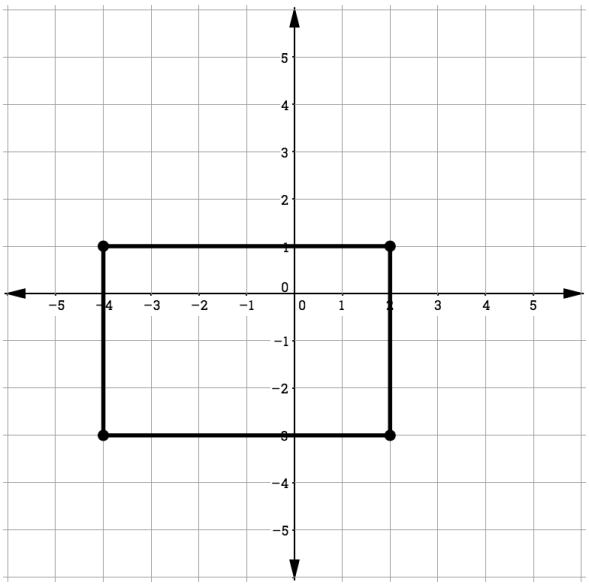
Part A: If the image is reflected across the line $x = 3$, does the transformation result in the original pre-image?

Part B: If the image is reflected across the line $y = 3$, does the transformation result in the original pre-image?

4. Complete the following paragraph.

In regular polygons, if the number of sides, n, is odd, the lines of symmetry will pass through a _____ and the _____ of the opposite side. If n is even, then the lines of symmetry will pass through two _____ vertices or the _____ of two opposite sides.

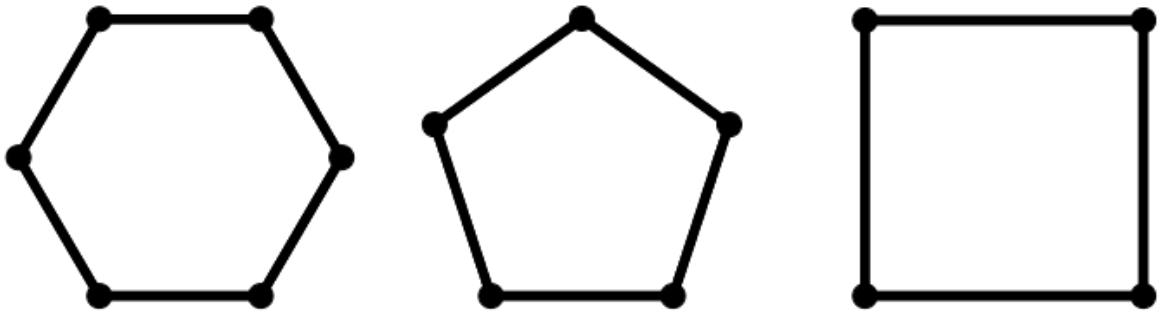
5. Consider the rectangle below.



Part A: Write the equation of a *horizontal* line that will map the figure onto itself after a reflection across that line.

Part B: Write the equation of a *vertical* line that will map the figure onto itself after a reflection across that line.

6. Draw the lines of symmetry on the regular polygons below.



7. In a regular polygon with n sides, how many lines of symmetry are possible?

   Ⓐ $\frac{1}{2}n$

   Ⓑ n

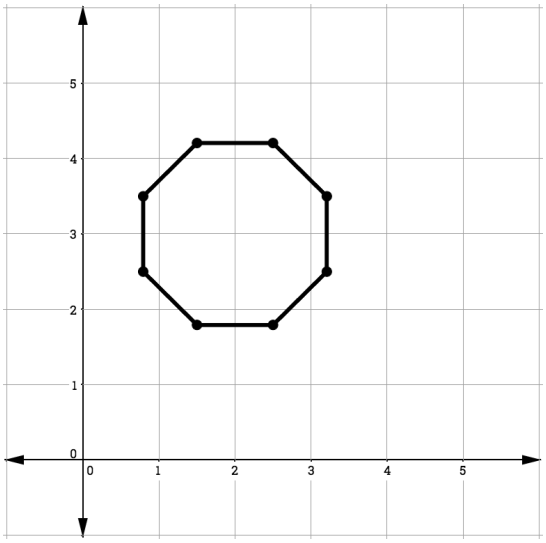
   Ⓒ $2n$

   Ⓓ $4n$

8. A regular pentagon can be rotated any multiple of ☐ about its central angle to be mapped back onto itself.

9. Consider a regular hexagon centered at $(3, 4)$. Describe a rotation that will map this regular hexagon onto itself.

10. Which of the following rotations will map the regular polygon below, centered at $(2, 3)$ onto itself? Select all that apply.



- ☐ Rotation of $360°$ centered at the origin
- ☐ Rotation of $360°$centered at $(2, 3)$
- ☐ Rotation of $90°$ centered at $(3, 5)$
- ☐ Rotation of $45°$ centered at $(2, 3)$
- ☐ Rotation of $225°$ centered at the origin
- ☐ Rotation of $270°$ centered at $(2, 3)$
- ☐ Rotation of $181°$ centered at $(2, 3)$