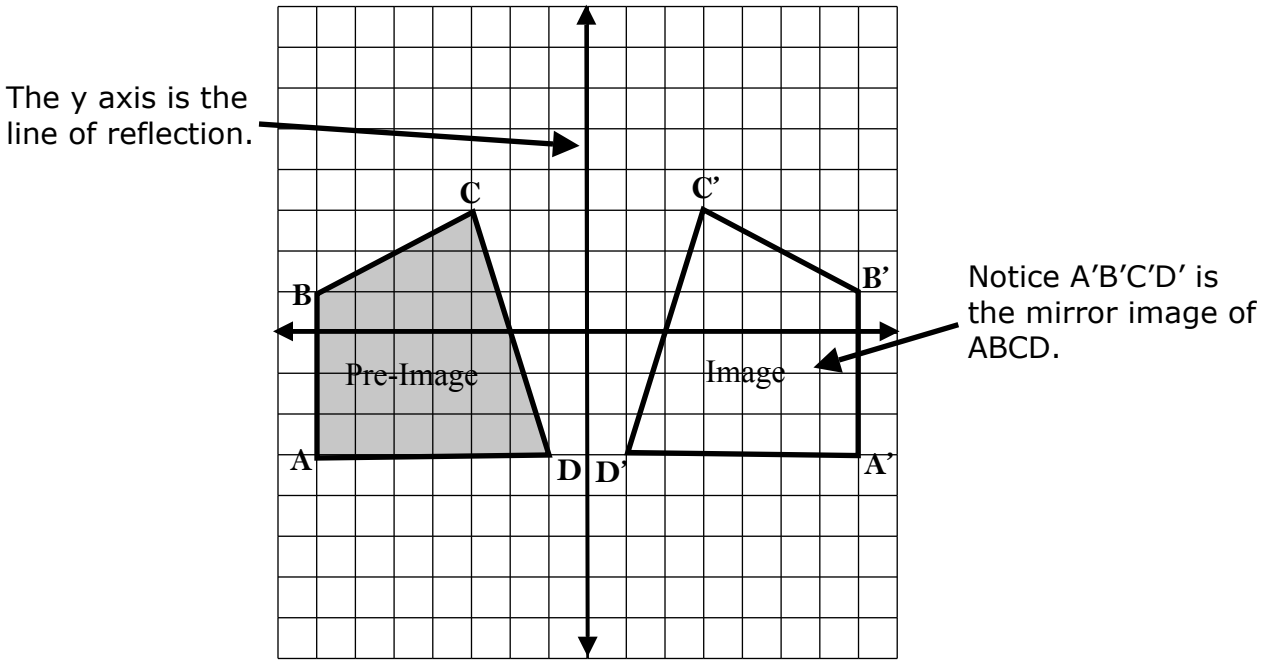
Name:_____ Date:_____ Period:_____ Score:_____

Isometric Transformations: Reflections

Reflections: A transformation in which every point from a figure maps to its mirror image on the other side of a line of reflection.

The line of reflection also becomes an axis of symmetry.

In the example below, ABCD was reflected through the y axis. We can use the notation: $\boldsymbol{R}_{y\ axis.}$



1. In the reflection above, compare |AB| and it's image |A'B'| by finding the lengths of each.

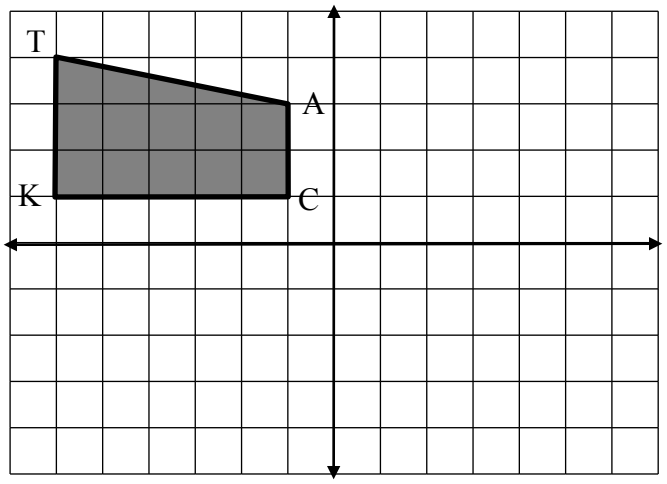
2. Compare the lengths of the other segments in ABCD to their images in A'B'C'D'. You might need to use the Pythagorean theorem.

3. Is the reflection above an isometric transformation? In other words, are ABCD and A'B'C'D' exactly the same size and shape? Why?

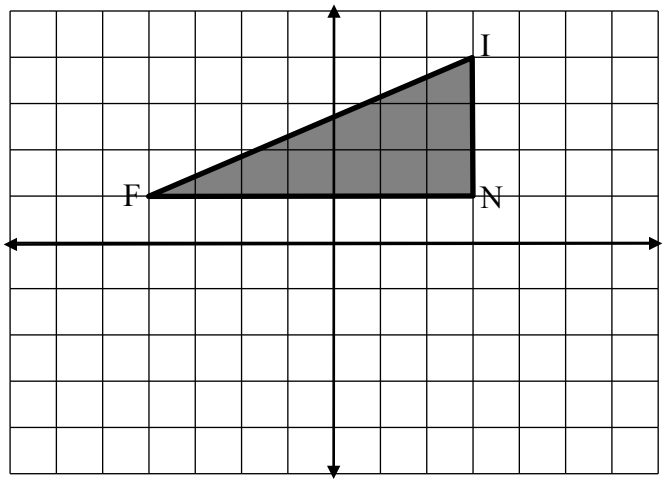
Name:_____ Date:_____ Period:_____ Score:_____

Directions: Use patty paper, Geometry software, or any other method to reflect each figure as directed. Make sure to label your image figure correctly.

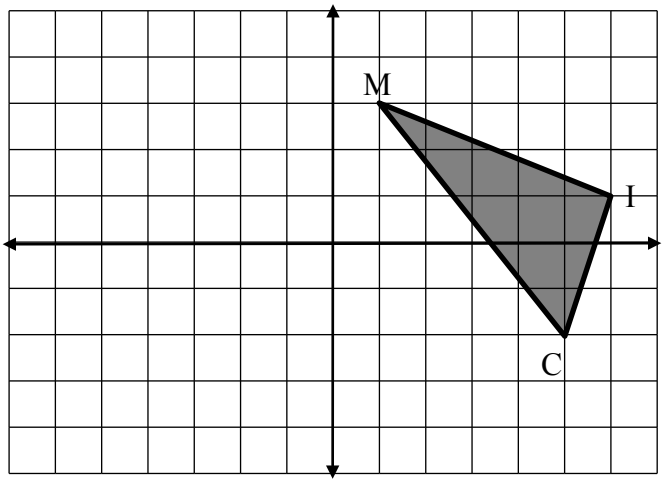
1. Reflect TACK through the y axis. $R_{y\ axis}$



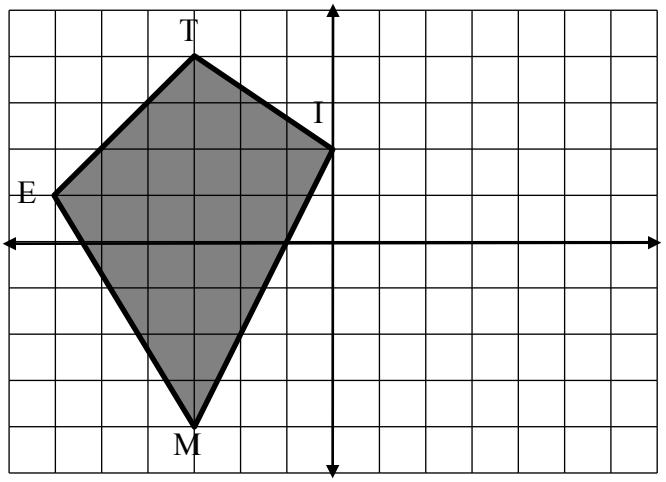
2. Reflect FIN through the x axis. $R_{x\ axis}$



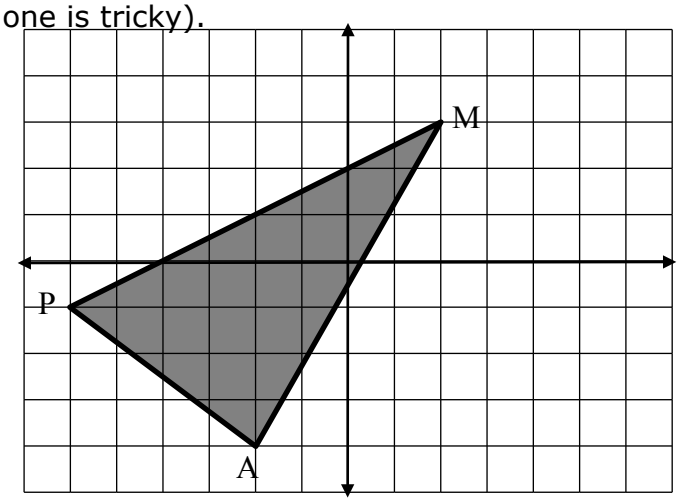
3. Reflect MIC through the y axis. $R_{y\ axis}$



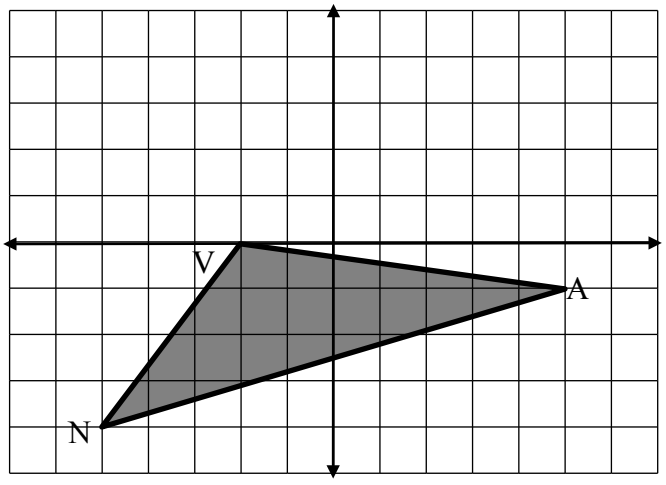
4. Reflect TIME through the y axis. $R_{y\ axis}$



5. Reflect MAP through the Y axis. $R_{y\ axis}$ (this one is tricky).



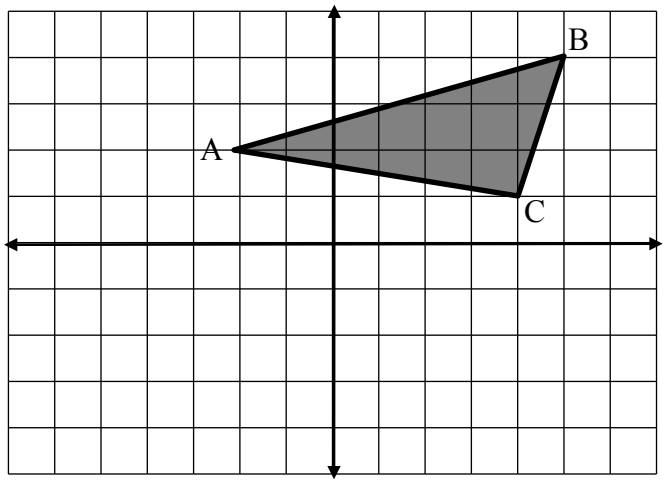
6 Reflect VAN through the x axis. $R_{x\ axis}$



Name:_____ Date:_____ Period:_____ Score:_____

Directions: Refer to some of the problems on the previous page to help you make conjectures about the functions of rotations about the origin.

7. Reflect ABC through the x axis.



a. What are the coordinates of the vertices of the original figure?

A(_____,_____) B(_____,_____) C(_____,_____)

b. What What are the coordinates of the vertices of A'B'C'?

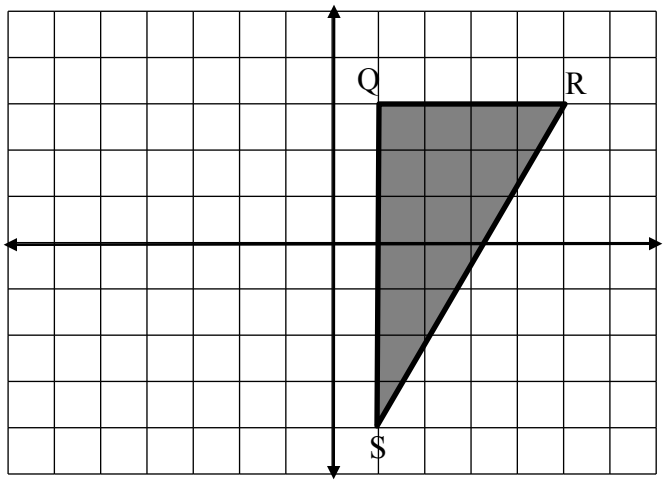
A' (_____,_____) B'(_____,_____) C'(_____,_____)

c. Explain in writing how the coordinates of ABC have been changed to create A'B'C' in this reflection through the x axis.

d. Write a function that describes a reflection through the x axis.

(____,____) → (_____,_____)

8. Reflect QRS through the y axis.



a. What are the coordinates of the vertices of the original figure?

Q(_____,_____) R(_____,_____) S(_____,_____)

b. What What are the coordinates of the vertices of Q'R'S' ?

Q' (_____,_____) R'(_____,_____) S'(_____,_____)

c. Explain in writing how the coordinates of QRS have been changed to create Q'R'S' in this reflection through the x axis.

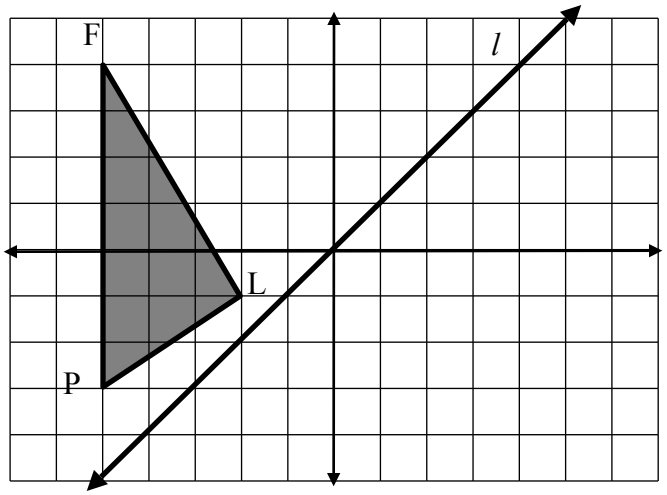
d. Write a function that describes a reflection through the x axis.

(____,____) → (_____,_____)

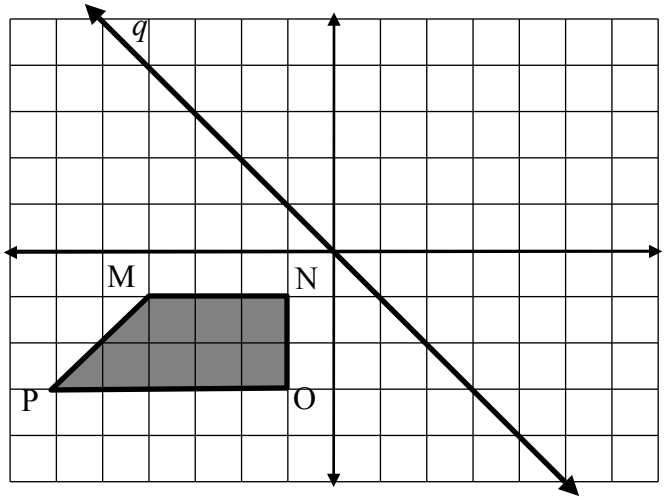
Name:_____ Date:_____ Period:_____ Score:_____

Directions: You can also reflect figures through lines other than the x and y axis. For these, use patty paper, geometry software, or any other method you choose to perform each reflection.

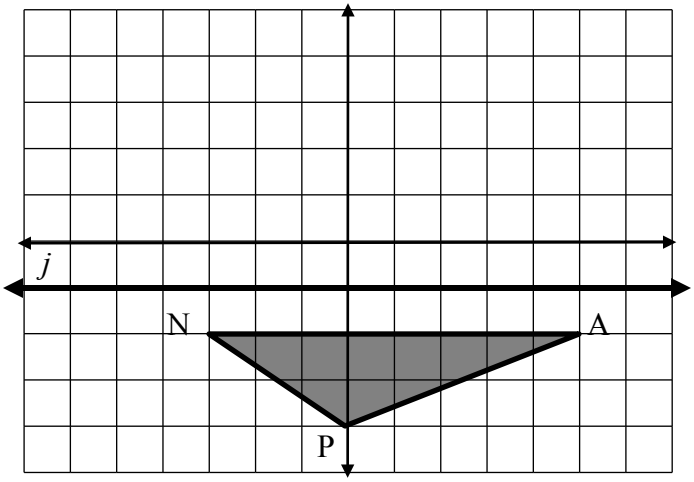
1. Reflect FLP through line *l*. R_l



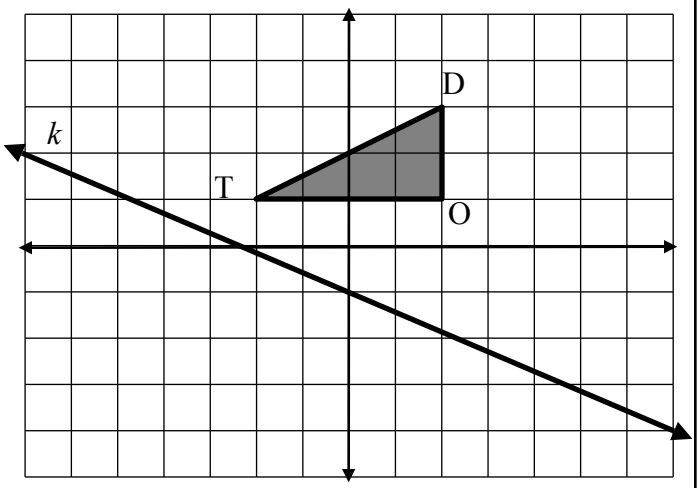
2. Reflect MNOP through line *q*. R_q



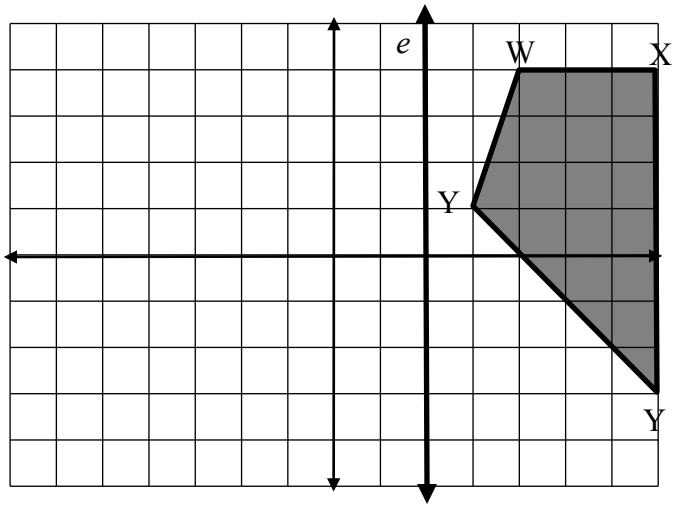
3. Reflect NAP through line *j*. R_j



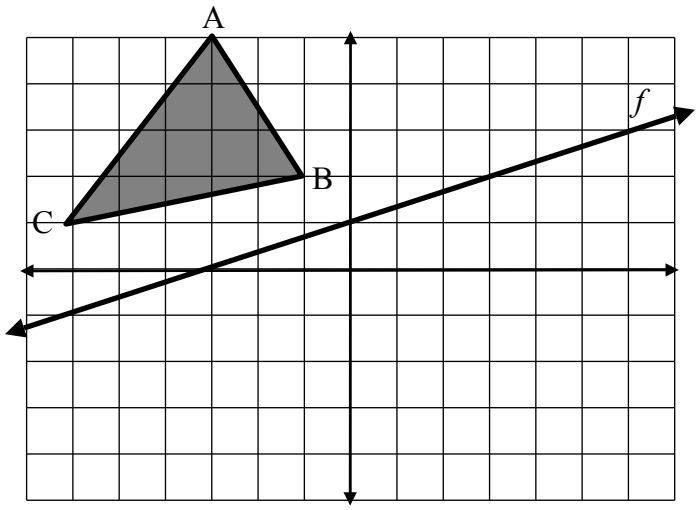
4. Reflect DOT through line *k*. R_k



5. Reflect WXYZ through line *e*. R_e



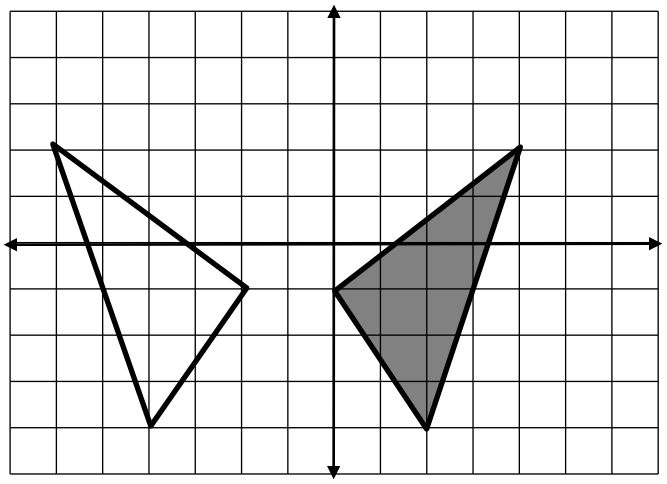
6 Reflect ABC through line *f*. R_f



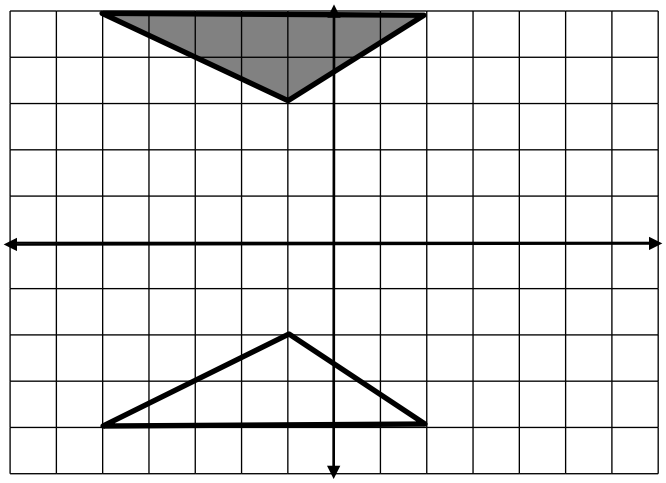
Name:_____ Date:_____ Period:_____ Score:_____

Directions: In each problem, a figure and it's image are shown. Draw the line of reflection that will map the original onto it's reflected image.

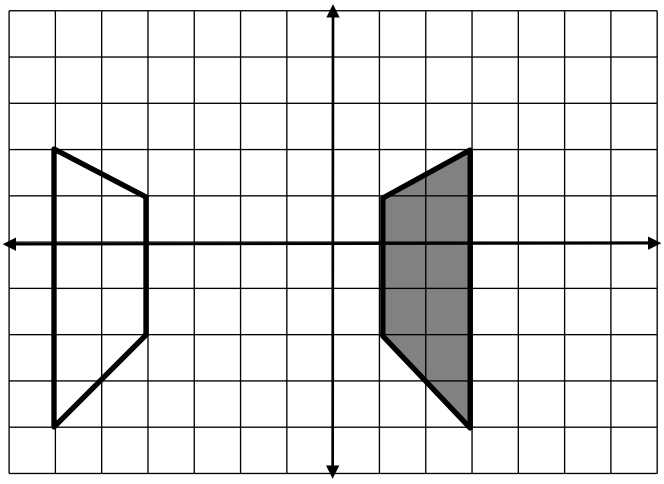
1



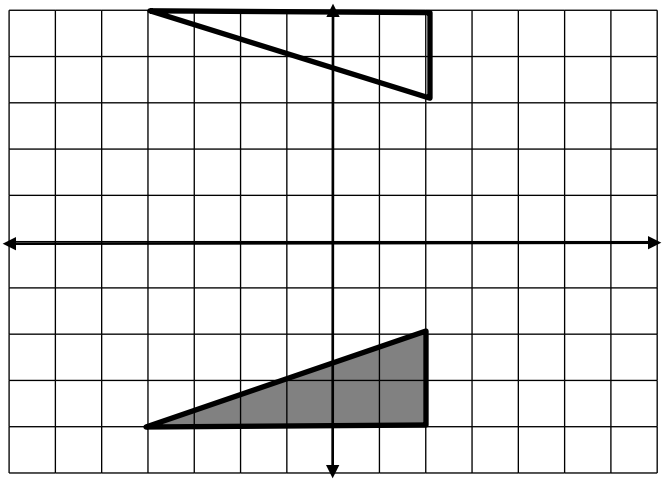
2



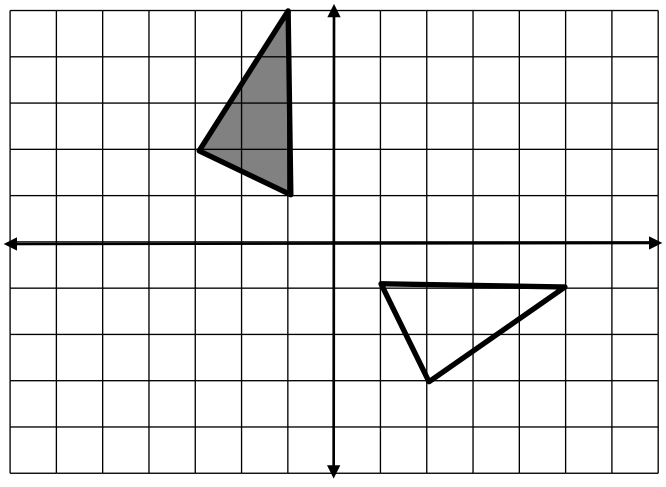
3



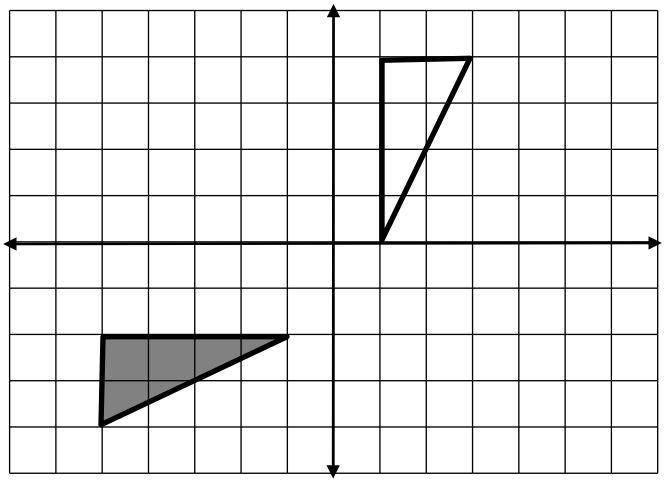
4



5



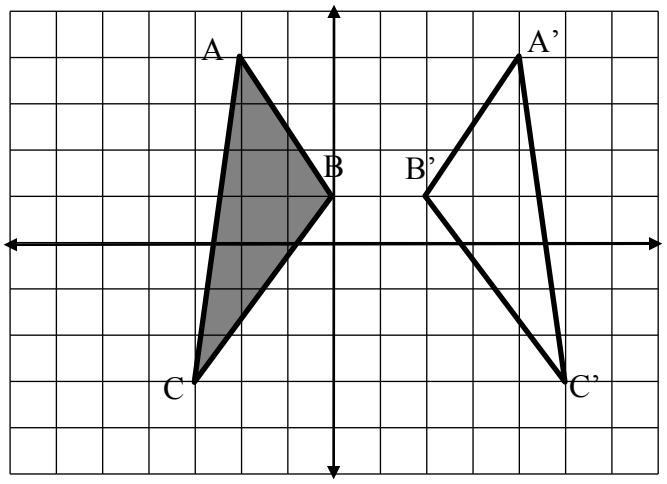
6



Name:_____ Date:_____ Period:_____ Score:_____

Directions: Answer each question.

7a. Draw the line of reflection that maps ABC to its image A'B'C'. Label the line *R*.



b. Draw arrows from each point in ABC to that points image.

c. What is |AA'|, |BB'| and |CC'|

|AA'|= _____ |BB'|=_____

|CC'|=_____

d. What is the length along $\overline{AA'}$ to the line of reflection? Is it the same length on both sides?

e. Repeat question d for $\overline{BB'}$ and $\overline{CC'}$.

f. This means that the line of reflection

_____ AA', BB' and CC'.

g. What appears to be the angle where $\overline{AA'}$, $\overline{BB'}$, and $\overline{CC'}$ intersect line *R*.

This means that the line of reflection is the

_____ of $\overline{AA'}$, $\overline{BB'}$ and $\overline{CC'}$.

Hilda says that this is true of any line of reflection. Quinn says that it isn't always true. Which one do you think is correct. Explain your answer.