

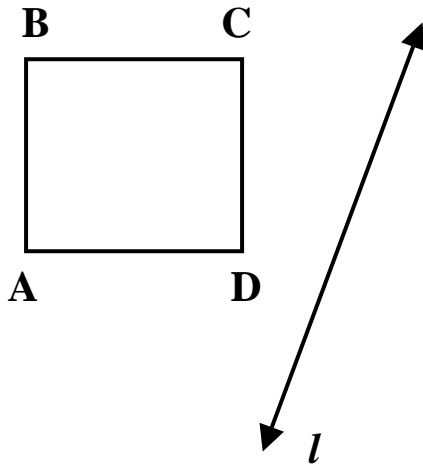
Kaleidoscopes, Hubcaps & Mirrors
Unit Test Study Guide

1. Draw the line(s) of reflectional symmetry, if they exist, in the following block letters and numbers:

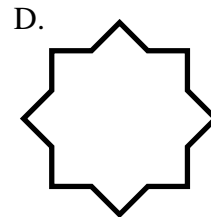
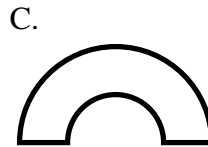
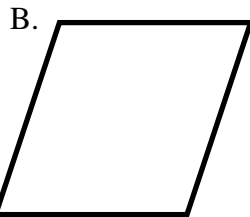
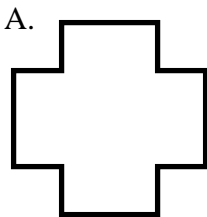
W B F S Y

One of the letters above has rotational symmetry. Write that letter here: _____

2. Draw the image of the figure below under a reflection over the line l . **Measure and label** the vertices of the image figure properly.



3. Which of the following figures does not have reflectional symmetry? _____



Check the boxes and/or fill in the blanks for each figure below:

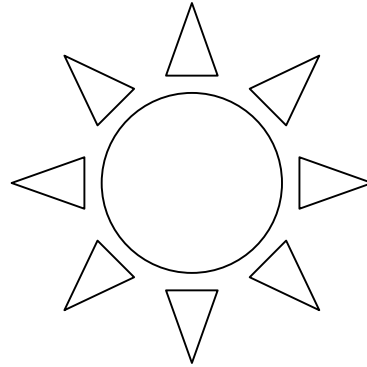
4. Reflectional Yes
Symmetry? No

If yes, draw the line(s) on the figure.

- Rotational Yes
Symmetry? No

If yes, a) Number of Turns _____

b) Degrees of Rotation _____



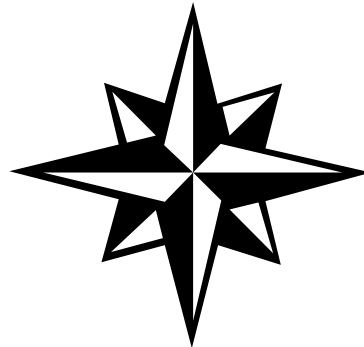
5. Reflectional Yes
Symmetry? No

If yes, draw the line(s) on the figure.

- Rotational Yes
Symmetry? No

If yes, a) Number of Turns _____

b) Degrees of Rotation _____



6. Matching:

_____ rotation

a) a transformation that *slides* each point on a figure to an image point a given distance and direction from the original point.

_____ tessellation

b) a transformation that *turns* a figure counterclockwise about a point.

_____ line reflection

c) a design made from copies of a basic design element that cover a surface without gaps or overlaps.

_____ translation

d) a transformation that matches each point on a figure with its mirror image over (i.e. *flipped* across) a line.

7. Point A has coordinates (3, -4). It is translated 5 units to the left and 6 units up. It is then reflected over the y -axis. The coordinates of the final image point are ____.

7. _____

8. Quadrilateral ABCD lies in Quadrant II. It is reflected over the x -axis. The image figure is then rotated 180° counter-clockwise about the origin. The final image lies in Quadrant _____.

8. _____

9. Triangle ABC with vertex A pointing upward lies in Quadrant III. The figure is rotated 90° counter-clockwise about the origin and then reflected over the y -axis. The final image lies in _____.

9. _____

- A) QI with A pointing left B) QI with A pointing right
 C) Q III with A pointing left D) QIII with A pointing right

10. Triangle ABC has coordinates as follows: **A** (-1, 2); **B** (-1, 6); and **C** (-4, 5).

- 1) Draw ABC
- 2) Draw A'B'C' as a 90° rotation about the origin.
- 3) Draw A''B''C'' as a reflection of A'B'C' over the y -axis.

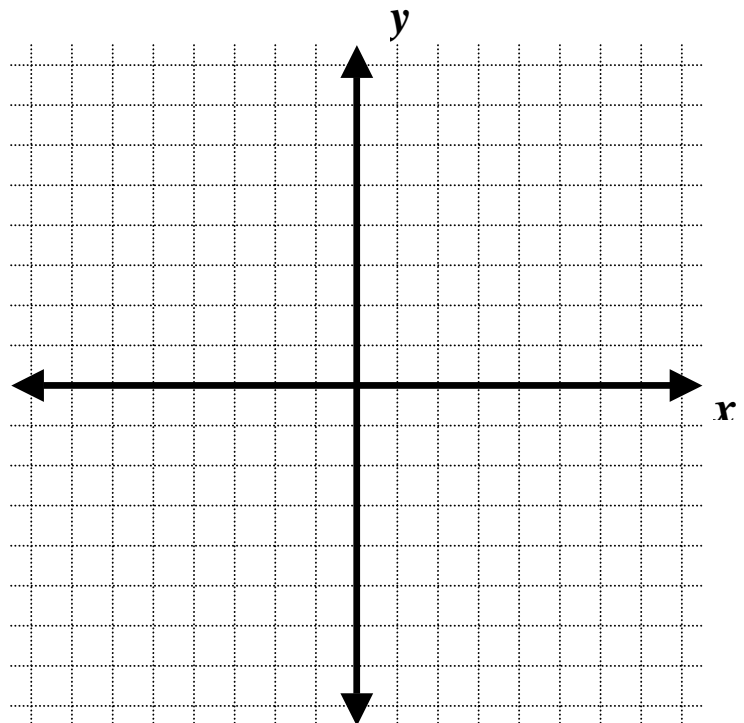
Label the ordered pairs for each image figure in the space provided below.

after rotation

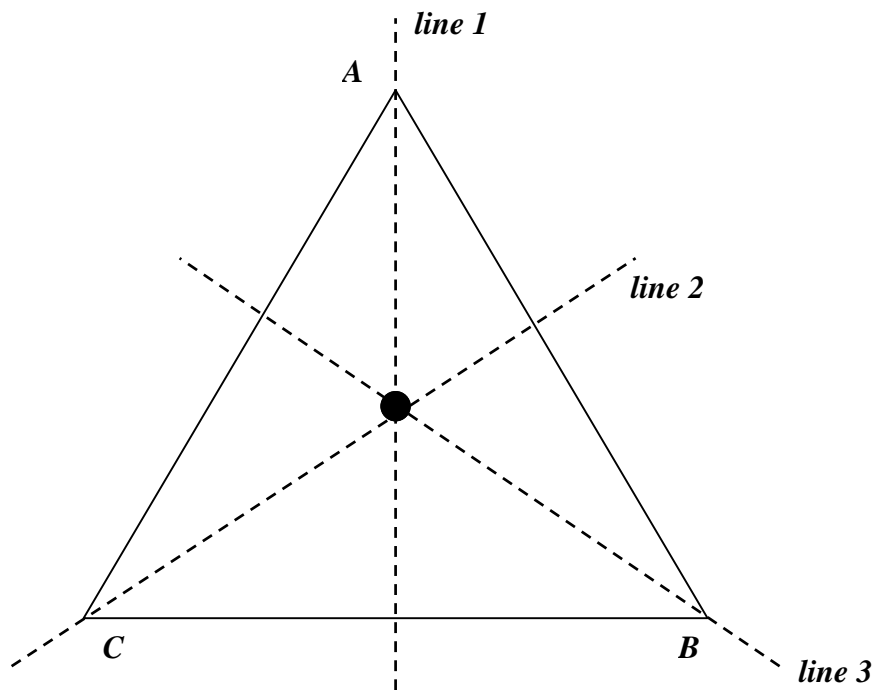
- A' ()
 B' ()
 C' ()

after reflection

- A'' ()
 B'' ()
 C'' ()



N.B. ALL 3 FIGURES MUST BE DRAWN



For the questions below, the following rules apply to the figure above:

L_1 : a line reflection over line 1

L_2 : a line reflection over line 2

L_3 : a line reflection over line 3

R_{120} : 120° about the center point

R_{240} : 240° about the center point

R_{360} : 360° about the center point

(N.B. all rotations are counter-clockwise)

Answer the questions below using the **Transformation Reference Sheet** provided.

11. $L_1 * R_{240}$

11. _____

12. $R_{120} * L_3 * R_{240}$

12. _____

13. $R_{240} * L_2 * R_{240} * L_2$

13. _____

14. True or False: An $L_1 * R_{360}$ is equivalent to an $R_{360} * L_1$?

14. _____

15. A good analogy for question #14 is:

15. _____

A. $3 * 5 = 5 * 3$

B. $7 * 1 = 1 * 7$

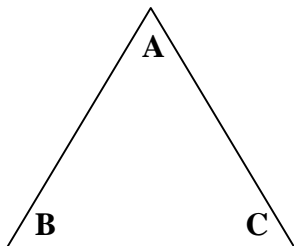
C. $9 - 3 = 3 - 9$

D. $14 \div 2 = 2 \div 14$

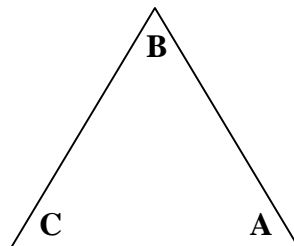
16. Explain your answer to question #15 below:

Transformation Reference Sheet

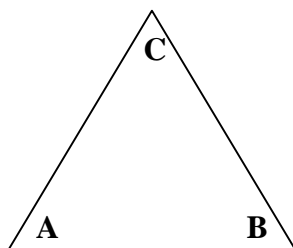
L₁



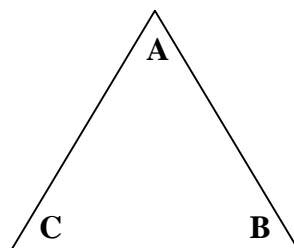
L₂



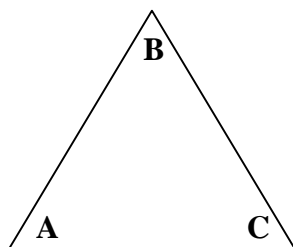
L₃



R₃₆₀



R₁₂₀



R₂₄₀

