Transformation Unit Review

Name ___________________________  Period _________  Date: __________

Determine the rule described in the transformations below.

1. Which transformation has occurred to quadrilateral AHUP?
   a. rotated 90°
   b. reflected across x-axis
   c. rotated 180°
   d. reflected across y-axis

2. Which transformation has occurred to triangle UXS?
   a. rotated 90°
   b. reflected across x-axis
   c. rotated 180°
   d. reflected across y-axis

3. Which transformation has occurred to quadrilateral AKJI?
   a. reflected across y = x
   b. rotated 270°
   c. reflected across x-axis
   d. rotated 360°

4. Which transformation has occurred to quadrilateral BKHP?
   a. reflected across y = x
   b. rotated 270° CCW
   c. reflected across x-axis
   d. rotated 360°
Find the coordinates of the vertices of each figure after the transformations.

5. What would be the vertices of the image if the pre-image had vertices $A(2, -2), B(1, 2), C(3, 3), D(5, 2)$ and they were rotated $180^\circ$ CW about the origin?
   
   a. $A'(2, -2), B'(-1, 2), C'(-3, 3), D'(-5, 2)$
   
   b. $A'(-2, 2), B'(-1, -2), C'(-3, -3), D'(-5, -2)$

6. What would be the vertices of the image if the pre-image had vertices $A(2, -2), B(1, 2), C(3, 3), D(5, 2)$ and they were rotated $270^\circ$ CCW about the origin? $90^\circ$ CW

   a. $A'(2, -2), B'(-1, 2), C'(-3, 3), D'(-5, 2)$
   
   b. $A'(-2, 2), B'(-1, -2), C'(-3, -3), D'(-5, -2)$

   c. $A'(-2, -2), B'(2, -1), C'(3, -3), D'(2, -5)$

   d. $A'(2, -2), B'(2, 1), C'(3, -3), D'(2, 5)$

7. On the graph to the right draw and label the triangle with vertices $A(-4, 5), B(3, 2), C(-1, -4)$ after all of the transformations listed below are done. DRAW all the images.

   1. Translated 2 unit right and 2 units up
   
   2. Reflect across $y = x$
   
   3. Rotate 90 degrees CCW about the origin

Vocabulary review:

8. List important Characteristics of each.

   a) Rigid Transformation/Isometry
      Congruent

   b) Translations
      Slide

   c) Reflections
      Flip

   d) Rotations
      Turn

   e) Dilations
      Enlarge/Shrink

   f) Composition for Transformations
      Multiple Transform
9. What is the difference between two figures that are congruent and two figures that are similar?

**Congruent** has same shape & size
**Similar** has same shape & angle measure.

10. Name the ordered pair rule that transforms each figure into its image.

- Rule: \((x, y) \rightarrow (y, -x)\) (90° clockwise)
- Rule: \((x, y) \rightarrow (-x, y)\) (reflect over y-axis)
- Rule: \((x, y) \rightarrow (x-3, y+5)\) (translation)

Complete the following transformations on the figure:

11. Translate \(ABCD\) by the rule \((x, y) \rightarrow (x - 5, y)\), then rotate the figure 180°.

12. Which sequence of transformations maps \(\triangle ABC\) to \(\triangle RST\)?

A. Reflect \(\triangle ABC\) across the line \(x = -1\). Then translate the result 1 unit down.
B. Reflect \(\triangle ABC\) across the line \(x = -1\). Then translate the result 5 units down.
C. Translate \(\triangle ABC\) 6 units to the right. Then rotate the result 90° clockwise about the point \((1, 1)\).
D. Translate \(\triangle ABC\) 6 units to the right. Then rotate the result 90° counterclockwise about the point \((1, 1)\).
12. Describe the sequences required for the following transformation below:

\[ \begin{align*}
&\text{rotate } 90^\circ \text{ ccw then reflect over } x=2 \\
&(3, 4) \rightarrow (-4, 3) \rightarrow (-3, -4) \\
&\text{reflect over } x=2
\end{align*} \]

13. Quadrilateral ABCD is rotated 90° counterclockwise (or 270° clockwise) about the origin. Name the new coordinates.

<table>
<thead>
<tr>
<th>Original Coordinates</th>
<th>A (1, 3)</th>
<th>B (3, 4)</th>
<th>C (6, 5)</th>
<th>D (1, 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Coordinates</td>
<td>-3, 1</td>
<td>-4, 3</td>
<td>-5, 6</td>
<td>-5, 1</td>
</tr>
</tbody>
</table>

14. Find the Center of Dilation and the Scale Factor for the following:

a) Scale factor 2

15. Find the coordinates of the vertices of the figure after a dilation of \( k = 2 \) centered at the point (1, -3) and graph the image.

\[ \begin{align*}
&x(2, 4) \rightarrow x'(-5, 11) \\
y(-4, 1) \rightarrow y'(-13, 5) \\
z(-4, 5) \rightarrow z'(-9, 7)
\end{align*} \]