Transformations Test
Multiple Choice (1 point each)

Directions: Circle the correct response for each question. Make sure your answer is clearly marked.

1. Which of these describes the transformation of the triangle?
   a. Reflection over the x-axis
   b. Reflection over the y-axis
   c. Rotation of 90° clockwise about the origin
   d. Rotation of 180° clockwise about the origin

2. Which transformation will result in an image which is similar, but not congruent, to the pre-image?
   f. dilation
   g. glide reflection
   h. rotation
   j. translation

3. Which of these transformations describe the footprints shown above?
   a. dilation
   b. glide reflection
   c. reflection
   d. rotation

4. A figure is located entirely in the third quadrant. If it is reflected over the y-axis, in which quadrant will its image lie?
   f. first
   g. second
   h. third
   j. fourth
5. Triangle QRS is translated four units to the left and two units up. Which ordered pair is a vertex of the translated image?
   a. (-1,3)
   b. (1,-3)
   c. (1,3)
   d. (3,1)

6. Which of these can transformations occurs when the fan blades turn?
   f. dilation
   g. reflection
   h. rotation
   j. translation

7. Which of the following describes the transformation shown here?
   a. dilation with a scale factor of 2
   b. rotation of 90° counterclockwise
   c. reflection over the x-axis
   d. translation up 2 units

8. Triangle JKL has vertices J(2,4), K(3,1), and L(3,3). A translation maps the point J to J'(3,3). What are the coordinates of K'?
   f. (-3,1)
   g. (2,2)
   h. (3,2)
   j. (4,0)

9. The marching band enters the gym and marches across the gym without turning. Which of these describes the transformation?
   a. dilation
   b. reflection
   c. rotation
   d. translation
10. Which of the following transformations has the same result as a rotation of $90^\circ$ clockwise?
   f. dilation of scale factor of 9
g. reflection about a horizontal line
   h. rotation of $270^\circ$ counterclockwise
   j. translation down and to the right

11. Which transformation best describes the image of an object viewed through a microscope?
   a. dilation
   b. reflection
   c. rotation
   d. translation

12. Which of the following describes the movement of a figure that is translated according to the rule below?
   \((x, y) \rightarrow (x - 7, y + 1)\)
   f. down 7 units and right 1 unit
g. left 7 units and up 1 unit
   h. right 7 units and down 1 unit
   j. up 7 units and left 1 unit

13. Which of these transformations could produce the image shown?
   a. dilation
   b. glide reflection
   c. rotation
   d. translation

14. A rectangular photo with dimensions of 1.5 inches wide by 2 inches long is enlarged to a length of 8 inches. What is the width of the enlarged print?
   f. 4 inches
g. 6 inches
   h. 8 inches
   j. 10 inches
15. Which of these transformations is not shown in the decorative square above?
   a. dilation
   b. reflection
   c. rotation
   d. translation

16. Which of these transformations describes an image in a mirror?
   f. dilation
   g. glide reflection
   h. reflection
   j. translation

17. The vertex of a figure is located at (2,4). The figure is rotated and the image of the vertex is located at (-4,-2). Which of these describes the transformation?
   a. reflection over the x-axis
   b. reflection over the y-axis
   c. rotation of 180º clockwise
   d. rotation of 270º clockwise

18. Which of these transformations describes sliding a box across the floor?
   f. dilation
   g. reflection
   h. rotation
   j. translation
Matching (1 point each)

Directions: Write the letter of the description for each transformation shown. Each letter may only be used once. Some letters will not be used.

19. _____ F

![Diagram of dilation, scale factor less than 1]

a. Dilation, scale factor less than 1

b. Dilation, scale factor of 1

c. Dilation, scale factor greater than 1

d. Glide reflection

e. Reflection over a horizontal line

f. Reflection over a vertical line

g. Rotation of 90º clockwise

h. Rotation of 180º counterclockwise

j. Rotation of 270º clockwise

k. Translation left and up

l. Translation right and up
Extended Response

23. **2 points** On the photo to the left, identify one transformation. Circle and label both the preimage and the image. What type of transformation do you see?

Answers vary. See rubric.

24. **2 points.** On the grid provided to the right, graph the image of the rotation of the polygon 180° counter-clockwise.

25.
Translation of a circle

a. 1 point. On the grid provided, translate Circle A according to the following rule.

\[(x, y) \rightarrow (x + 3, y)\]

b. 1 point. Label the center of the image A'. Identify the center of the image.

A' \( (4,2) \)
26. Reflection of a trapezoid across intersecting lines

a. **1 point.** On the grid provided, reflect trapezoid ABCD over the *y-axis*. Label the corresponding vertices of the image A', B', C' and D' respectively.

b. **1 point.** Now, reflect this image, trapezoid A'B'C'D', over the *x-axis*. Label the corresponding vertices A", B", C" and D", respectively.

c. **1 point.** Identify the vertices of the images in the table below.

<table>
<thead>
<tr>
<th>Pre-image</th>
<th>Reflection over the y-axis</th>
<th>Reflection over the x-axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertex</td>
<td>Ordered Pair</td>
<td>Vertex</td>
</tr>
<tr>
<td>A</td>
<td>(2,3)</td>
<td>A'</td>
</tr>
<tr>
<td>B</td>
<td>(4,1)</td>
<td>B'</td>
</tr>
<tr>
<td>C</td>
<td>(6,2)</td>
<td>C'</td>
</tr>
<tr>
<td>D</td>
<td>(3,5)</td>
<td>D'</td>
</tr>
</tbody>
</table>

d. **2 points.** Which other single transformation could map trapezoid ABCD to trapezoid A"B"C"D"? (Identify the type of transformation and any points, lines, directions or measurements necessary to completely describe the transformation.)

**Rotation of 180 degrees**
<table>
<thead>
<tr>
<th>Supply Response Item #23</th>
<th>1.0</th>
<th>.50</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of preimage and image on photo</td>
<td>A preimage and corresponding image are circled and labeled. A transformation is possible between the preimage and image.</td>
<td>A preimage and corresponding image are circled, but not labeled. A transformation is possible between the preimage and image.</td>
<td>Transformation is not possible between the two items identified.</td>
</tr>
<tr>
<td>Identification of transformation</td>
<td>The transformation is correct for the preimage and image identified in the photo.</td>
<td>The transformation is misidentified, but details of the correct transformation are indicated.</td>
<td>The transformation and any accompanying details are missing or inaccurate.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply Response Item #24</th>
<th>2.0</th>
<th>1.5</th>
<th>1.0</th>
<th>.50</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graph of rotation</td>
<td>Image lies in quadrant III. All vertices have been accurately mapped.</td>
<td>Image lies in quadrant III. Some vertices are not mapped correctly. Most vertices are correctly labeled.</td>
<td>Image lies in quadrant II or IV. All vertices have been accurately rotated according to this rotation.</td>
<td>Image lies in quadrant II or IV. Shape or orientation is severely distorted.</td>
<td>No image shown.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supply Response Item #25</th>
<th>1.0</th>
<th>.75</th>
<th>.50</th>
<th>.25</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Translation of Circle</td>
<td>Image lies in quadrant I. The center has been correctly mapped and the radius and shape of the circle are maintained.</td>
<td>Image lies in quadrant I. The center of the circle has been correctly mapped, but the circle is distorted.</td>
<td>Image has been translated to the left. Circle shape and size are maintained.</td>
<td>Image has been translated to the left. Circle is severely distorted.</td>
<td>No image shown.</td>
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<tr>
<td>Supply Response Item #26</td>
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<tr>
<td><strong>Graph of reflection over the y-axis</strong></td>
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<tr>
<td>1.0</td>
<td>Image lies in quadrant II. All vertices have been accurately mapped and are correctly labeled.</td>
<td>Image lies in quadrant II. All vertices have been accurately reflected, but some labels are missing or incorrect.</td>
<td>Image lies in quadrant II. Some vertices are not mapped correctly. Most vertices are correctly labeled. OR Image lies in quadrant IV. Vertices are mapped according to a reflection over the x-axis. All vertices are correctly labeled.</td>
<td>Image lies in quadrant II. Shape or orientation is severely distorted. OR Image lies in quadrant IV. Vertices are mapped according to a reflection over the x-axis. All vertices are correctly labeled.</td>
<td>No image shown.</td>
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<td>.75</td>
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<td>0</td>
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<tr>
<td><strong>Graph of reflection over the x-axis</strong></td>
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<tr>
<td>Image lies in quadrant III. All vertices have been accurately mapped and are correctly labeled.</td>
<td>Image lies in quadrant III. All vertices have been accurately reflected, but some labels are missing or incorrect.</td>
<td>Image lies in quadrant III. Some vertices are not mapped correctly. Most vertices are correctly labeled.</td>
<td>Image lies in quadrant III. Shape or orientation is severely distorted.</td>
<td>No image shown.</td>
<td></td>
</tr>
<tr>
<td>1-3 ordered pairs are correct according to the graph.</td>
<td>6-7 ordered pairs are correct according to the graph.</td>
<td>4-5 ordered pairs are correct according to the graph.</td>
<td>None of the ordered pairs correspond to the graph.</td>
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<td></td>
</tr>
<tr>
<td><strong>Identification of Vertices</strong></td>
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</tr>
<tr>
<td>All ordered pairs are accurate according to graph shown.</td>
<td>6-7 ordered pairs are correct according to the graph.</td>
<td>4-5 ordered pairs are correct according to the graph.</td>
<td>1-3 ordered pairs are correct according to the graph.</td>
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<tr>
<td><strong>Identification of the other transformation possible. (x2)</strong></td>
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<tr>
<td>Identifies the rotation about the origin and a measure of 180 degrees.</td>
<td>Identifies the rotation and either the origin or the measure of 180 degrees.</td>
<td>Identifies the rotation only.</td>
<td>Misidentification of the type of transformation, but includes the origin or a measurement of 180 degrees.</td>
<td>Incorrectly identifies the transformation and all additional details.</td>
<td></td>
</tr>
</tbody>
</table>