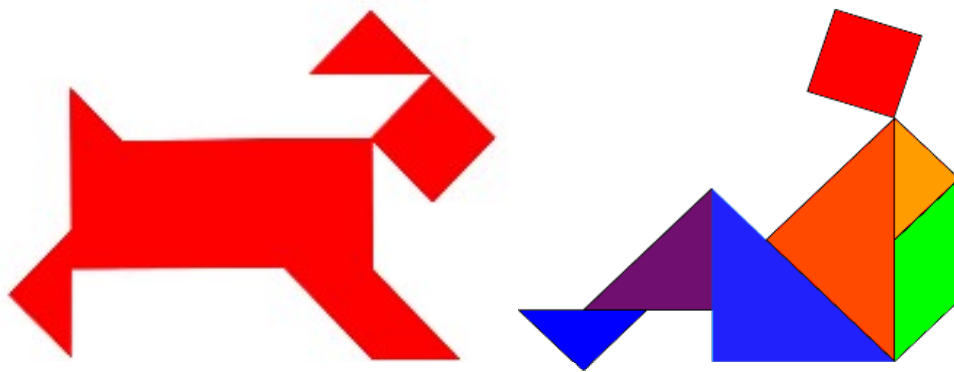


Puzzling Transformations

(Translations, Reflections, Rotations, Dilations)

Art Activity

Common Core ~ 8.G.A.3



This puzzle is just 1 of 8 transformation puzzles that can be bought as a bundle for \$5.00. The bundle includes combinations of translations, reflections, rotations, and dilations. Check it out at:

<https://www.teacherspayteachers.com/Product/Transformations-Bundle-Puzzle-Art-Common-Core-8GA3-1934632>

Created by Rockin' Middle School Math

<https://www.teacherspayteachers.com/Store/Rockin-Middle-School-Math>

Activity Directions

Objective:

8.G.A.3 - Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates.

Materials:


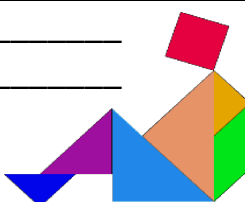
- One copy of student worksheet per student
- One copy of 4 quadrant coordinate plane
- Colored pencils, markers or crayons
- One ruler per student

Procedure:

- Students should apply the rules for transformations to the Pre-Image coordinates given on the worksheet and then plot the resulting points on the coordinate plane.
- Students will then use a ruler to connect the points to make each figure.
- Students can color their picture when all of the pieces are complete. They can add other drawings/objects to the picture to decorate it nicely.
- None of the transformations will overlap, so if a student has two images overlapping, he/she made a mistake.

Alternate Ideas:

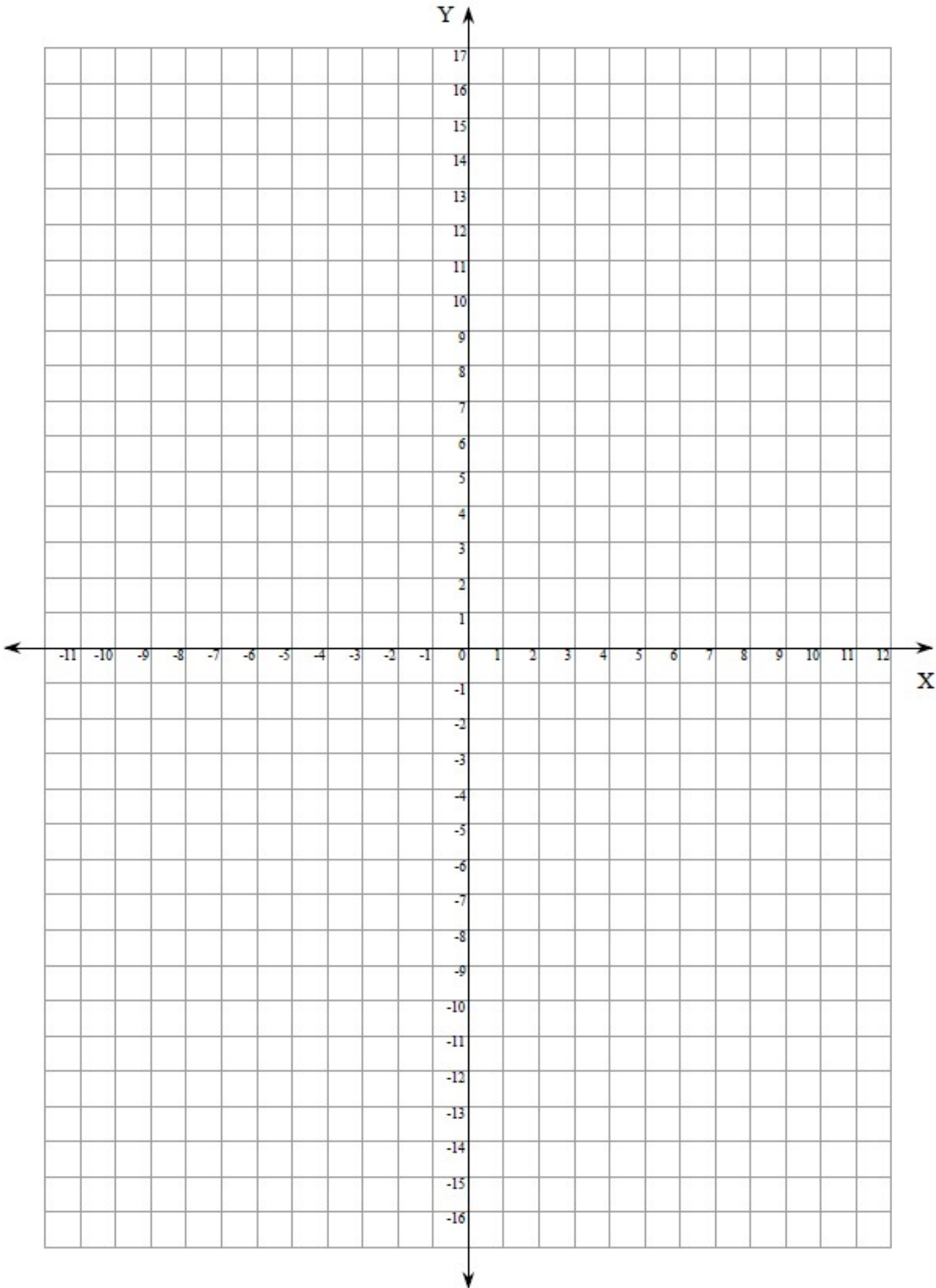
- Students could plot and connect the Pre-Image points on another sheet of graph paper. Then they could complete the transformations before recording answers on the worksheet.
- Plot and connect the Pre-Image points on another sheet of graph paper, cut them out, and use them to manually transform the figures on another sheet of graph paper.
- This activity could be done on dry erase boards, then copied onto graph paper.

<p>Name: _____</p> <p>Date: _____</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>	<p>Puzzle # 8: Perform each transformation using the given pre-image points. Plot the points of the new image on the provided coordinate plane. Connect the points in each problem to make a polygon. When done, you may color your design.</p>
<p>1. Reflect over the x-axis, and then dilate by a scale factor of $\frac{1}{2}$.</p> <p>A (-10, -10) B (6, 4) C (-10, 20)</p> <p>Post Image Coordinates:</p> <p>A' _____ B' _____ C' _____</p>	<p>2. Rotate 90° clockwise about the origin, and then dilate using a scale factor of $\frac{1}{4}$.</p> <p>A (16, 44) B (44, 32) C (24, 24)</p> <p>Post Image Coordinates:</p> <p>A' _____ B' _____ C' _____</p>
<p>3. Translate Pre Image coordinates using the rule (x - 3) and (y - 1).</p> <p>A (-3, 12) B (-1, 7) C (-6, 5) D (-8, 10)</p> <p>Post Image Coordinates:</p> <p>A' _____ B' _____ C' _____ D' _____</p>	<p>4. Rotate 270° counter clockwise about the origin, and then translate 7 units up.</p> <p>A (-6, -1) B (1, -4) C (-4, -6)</p> <p>Post Image Coordinates:</p> <p>A' _____ B' _____ C' _____</p>
<p>5. Translate 4 left, and then reflect over the y-axis.</p> <p>A (1, -2) B (1, -13) C (12, -13)</p> <p>Post Image Coordinates:</p> <p>A' _____ B' _____ C' _____</p>	<p>6. Translate 5 units down, and then rotate 90° counter clockwise about the origin.</p> <p>A (-6, -1) B (-11, -3) C (-13, 2)</p> <p>Post Image Coordinates:</p> <p>A' _____ B' _____ C' _____</p>
<p>7. Rotate 180° clockwise about the origin, and then translate 6 units to the right.</p> <p>A (14, -16) B (12, -11) C (17, -9)</p> <p>Post Image Coordinates:</p> <p>A' _____ B' _____ C' _____</p>	<p>8. Dilate about the origin by a scale factor of 5.</p> <p>A (-1, 1) B (-1, -1) C (-2, 0)</p> <p>Post Image Coordinates:</p> <p>A' _____ B' _____ C' _____</p>

Name: _____

Date: _____

Geometric Transformations



Cheat Sheet: Transformation Rules

1. Translations:

Right-Add to the x coordinate

Up- Add to the y coordinate

Left-Subtract from the x coordinate

Down- Subtract from the y coordinate

2. Reflections:

Reflecting over the x-axis: change the sign of the y coordinate to its opposite.

Reflecting over the y-axis: change the sign of the x coordinate to its opposite.

3. Rotations About the Origin:

90° Clockwise – Swap the coordinates and change the sign of the new y coordinate to its opposite.

90° Counter – Clockwise – Swap the coordinates and change the sign of the new x coordinate to its opposite.

180° Clockwise or Counter – Clockwise – Do not swap coordinates, just change the sign of both the x and y coordinates to their opposites.

270° Clockwise – Do the same as when you rotate **90° Counter-Clockwise**.

270° Counter – Clockwise – Do the same as when you rotate **90° Clockwise**.

4. Dilations About the Origin:

Multiply both coordinates by the scale factor.