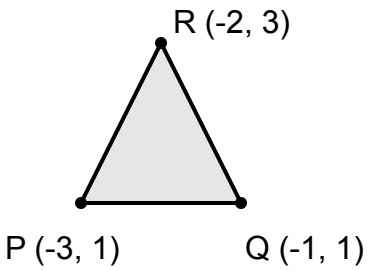
Coordinate Transformation Lab

Plot image coordinates after a translation, reflection, rotation, and dilation, then describe each effect.

Name: _____ Date: _____

Reference Figure and Translation

Use this original triangle for every question. The diagram and table give the coordinates of triangle PQR. In each work panel, plot only the image points P', Q', and R', then connect them in order.



Vertex	Coordinate
P	(-3, 1)
Q	(-1, 1)
R	(-2, 3)

Useful rules

Translation by (a, b): (x, y) -> (x + a, y + b)
Reflection across x-axis: (x, y) -> (x, -y)
90-degree counterclockwise rotation: (x, y) -> (-y, x)
Dilation from origin, factor k: (x, y) -> (kx, ky)

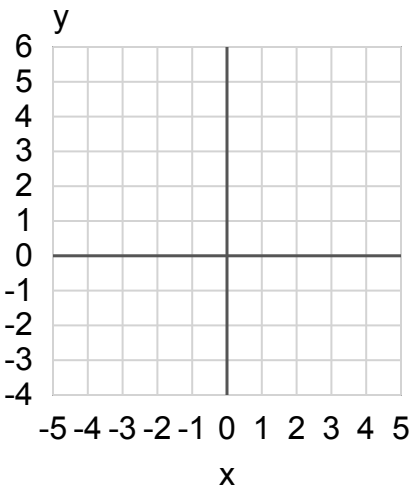
Coordinate Transformation Lab

Plot image coordinates after a translation, reflection, rotation, and dilation, then describe each effect.

Name: _____ Date: _____

Reference Figure and Translation (continued)

1. Translation: Translate triangle PQR by (4, -2). Plot and label P', Q', and R'.



P'	Q'	R'

Effect of the translation:

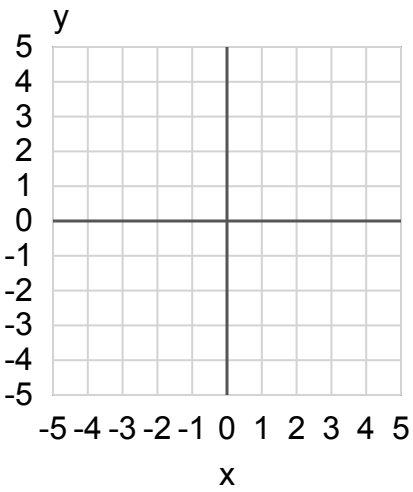
Coordinate Transformation Lab

Plot image coordinates after a translation, reflection, rotation, and dilation, then describe each effect.

Name: _____ Date: _____

Reflection and Rotation

2. Reflection: Reflect triangle PQR across the x-axis. Plot and label P', Q', and R'.



P'	Q'	R'

Effect of the reflection:

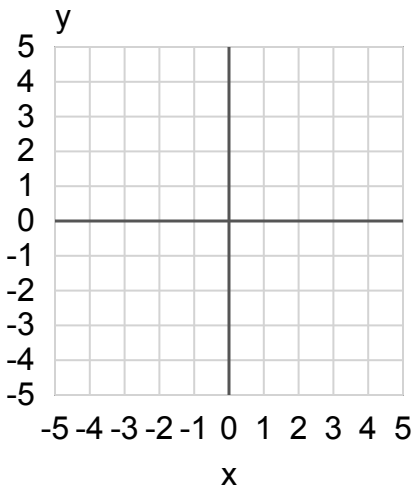
Coordinate Transformation Lab

Plot image coordinates after a translation, reflection, rotation, and dilation, then describe each effect.

Name: _____ Date: _____

Reflection and Rotation (continued)

3. Rotation: Rotate triangle PQR 90 degrees counterclockwise about the origin. Plot and label P', Q', and R'.



P'	Q'	R'

Effect of the rotation:

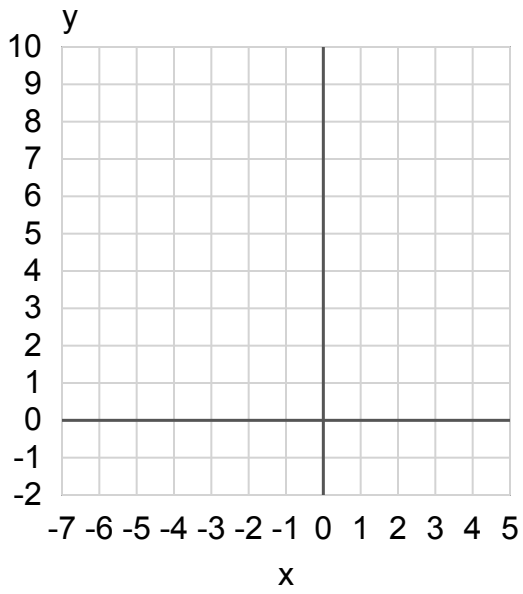
Coordinate Transformation Lab

Plot image coordinates after a translation, reflection, rotation, and dilation, then describe each effect.

Name: _____ Date: _____

Dilation

4. Dilation: Dilate triangle PQR from the origin with scale factor 2. Plot and label P', Q', and R'.



P'	Q'	R'

Effect of the dilation:

Coordinate Transformation Lab

Plot image coordinates after a translation, reflection, rotation, and dilation, then describe each effect.

Answer Key and Teaching Notes

Materials: Printed student pages, pencils, rulers, and optional tracing paper or transparent grid paper.

Setup: Print and supply all student pages, keeping teacher-key pages separate. Give students rulers. Each coordinate grid has equal physical horizontal and vertical unit lengths, so students can accurately compare side lengths and shapes. Remind students that they plot the image in each panel; the original triangle is supplied in the reference figure and coordinate table.

Teacher script - read aloud: “Use the table to begin with each original point. Apply the stated transformation to its coordinates. Then plot the image point and label it with a prime mark. A translation slides a figure. A reflection flips it across an axis. A rotation turns it around a center. A dilation changes distances from its center by a scale factor.”

1. Translation by (4, -2): P' (1, -1), Q' (3, -1), R' (2, 1). Add 4 to each x-coordinate and subtract 2 from each y-coordinate. Sample effect statement: “The triangle slides 4 units right and 2 units down. Its size, shape, and orientation stay the same.”

2. Reflection across the x-axis: P' (-3, -1), Q' (-1, -1), R' (-2, -3). Keep each x-coordinate and change the sign of each y-coordinate. Sample effect statement: “The triangle flips over the x-axis. Its size and shape stay the same, but its orientation is reversed.”

3. Rotation 90 degrees counterclockwise about the origin: P' (-1, -3), Q' (-1, -1), R' (-3, -2). Apply (x, y) -> (-y, x). Sample effect statement: “The triangle turns one quarter-turn counterclockwise around the origin. Its size and shape stay the same.”

4. Dilation centered at the origin, scale factor 2: P' (-6, 2), Q' (-2, 2), R' (-4, 6). Multiply both coordinates by 2. Sample effect statement: “Each image point is twice as far from the origin, so the image is larger but has the same shape.”

Observation method: During each work panel, inspect one plotted point before a student finishes. Record whether the student: (a) identifies the matching original coordinate, (b) applies the stated rule correctly, (c) plots and labels the image point accurately, and (d) gives an effect statement that fits the transformation. If support is needed, ask, “Which coordinate changes under this rule?” Do not provide the image coordinate.

Source credit: NY-8.G.3, “Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.” https://lessonmakerpro.com/standards/ny-nextgen-math/ny-8-g-3