

Grade 8 · Translations, Reflections and Rotations · Worksheet

Common Core 8.G.A.1, 8.G.A.3 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

These 26 problems practice Common Core standards 8.G.A.1 and 8.G.A.3. Translate, reflect and rotate points and polygons on the coordinate plane, identify a motion from its image, and use the fact that rigid motions keep lengths, angles and parallel lines.

The last six are word problems and multi-step tasks. Work from easiest to hardest, and draw each figure on graph paper when it helps.

Grade 8 Common Core: 8.G.A.1 · 8.G.A.3

Problem 1: Translate a point

Translate the point $(3, -2)$ 4 units right and 5 units up. Write the image.

Problem 2: Reflect a point in the x-axis

Reflect $(5, -3)$ across the x -axis. Write the image.

Problem 3: Reflect a point in the y-axis

Reflect $(-4, 6)$ across the y -axis. Write the image.

Problem 4: Rotate a point 180 degrees

Rotate $(2, -7)$ by 180° about the origin. Write the image.

Problem 5: Rotate a point 90 degrees

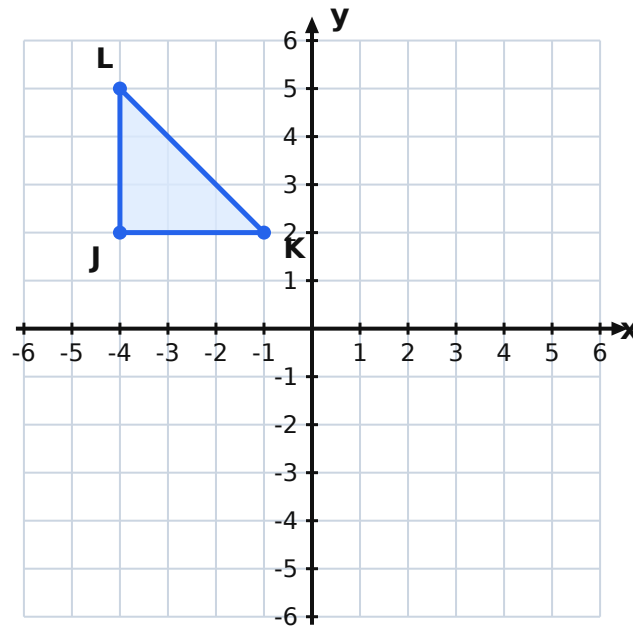
Rotate $(3, 5)$ by 90° counterclockwise about the origin. Write the image.

Problem 6: Rotate a point 270 degrees

Rotate $(4, -1)$ by 270° counterclockwise about the origin. Write the image.

Problem 7: Translate a triangle

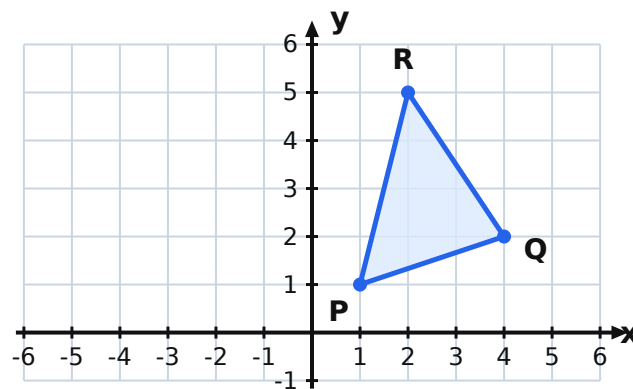
Translate triangle JKL using the rule $(x,y) \rightarrow (x+3, y-4)$. Write the coordinates of the image.



Triangle JKL .

Problem 8: Reflect a triangle

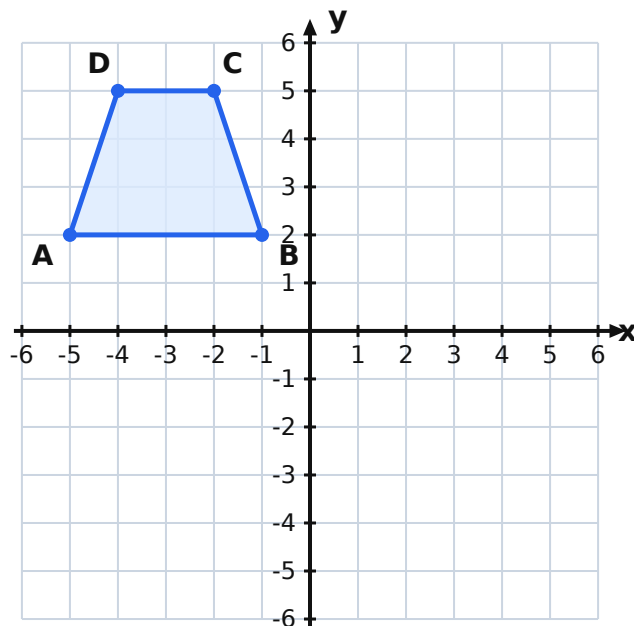
Reflect triangle PQR across the y -axis. Write the coordinates of the image.



Triangle PQR .

Problem 9: Reflect a trapezoid

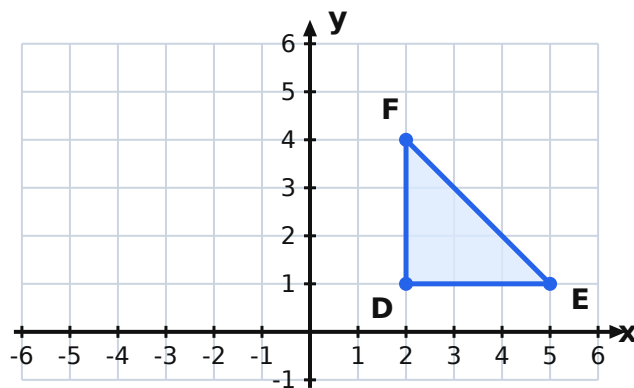
Reflect trapezoid $ABCD$ across the x -axis. Write the coordinates of the image.



Trapezoid $ABCD$.

Problem 10: Rotate a triangle 90 degrees

Rotate triangle DEF by 90° counterclockwise about the origin. Write the coordinates of the image.



Triangle DEF .

Problem 11: Rotate a parallelogram

Rotate parallelogram $WXYZ$ with vertices $W(1,1)$, $X(5,1)$, $Y(6,3)$, $Z(2,3)$ by 180° about the origin. Write the image.

Problem 12: Rotate a triangle 270 degrees

Rotate triangle GHI with vertices $G(-3,1)$, $H(-3,4)$, $I(-1,1)$ by 270° counterclockwise about

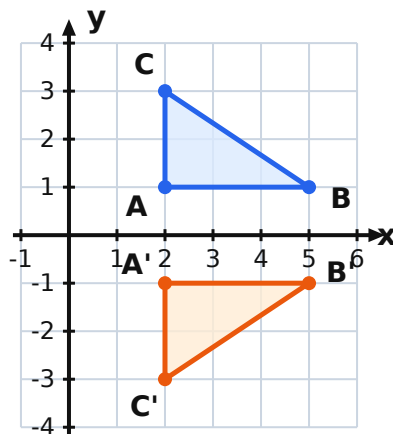
the origin. Write the image.

Problem 13: Describe a translation

Segment AB has endpoints $A(-2,1)$ and $B(0,4)$. Its image has endpoints $A'(3,-3)$ and $B'(5,0)$. Describe the translation and write its rule.

Problem 14: Identify the reflection

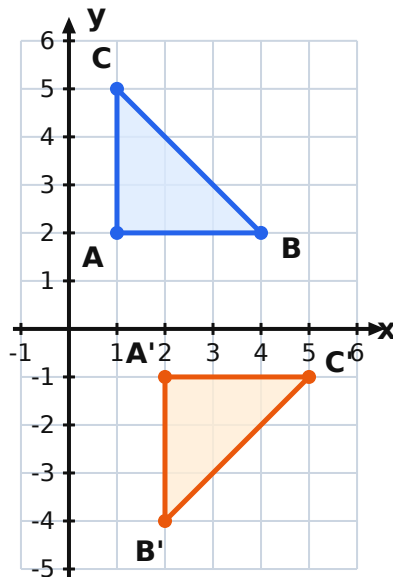
Triangle $A'B'C'$ is the image of triangle ABC after one reflection. Across which axis was it reflected? Give the rule.



Triangle ABC and its image.

Problem 15: Identify the rotation

Triangle $A'B'C'$ is the image of triangle ABC after a rotation about the origin. Decide whether the rotation is 90° , 180° or 270° counterclockwise.



Triangle ABC and its image.

Problem 16: Write the rule

A motion sends $(2,5)$ to $(-2,5)$ and $(-3,7)$ to $(3,7)$. Name the motion and write its rule.

Problem 17: What stays the same

Triangle DEF has $DE = 6$ cm, $EF = 8$ cm and $\angle E = 90^\circ$. It is reflected across the y -axis. Find $D'E'$, $E'F'$ and the measure of $\angle E'$.

Problem 18: Parallel lines

Line segment p joins $(1,1)$ and $(3,5)$. Segment q joins $(3,1)$ and $(5,5)$. Both are rotated 180° about the origin. Show that the images are parallel.

Problem 19: Translate, then reflect

Triangle ABC has vertices $A(1,2)$, $B(3,2)$, $C(1,5)$. Translate it 2 units left and 3 units down, then reflect the result across the y -axis. Write the final image.

Problem 20: Rotate, then reflect

Triangle PQR has vertices $P(1,1)$, $Q(4,1)$, $R(4,3)$. Rotate it 90° counterclockwise about the origin, then reflect the result across the x -axis. Write the final image.

Problem 21: Park map

On a park map, a bench is at $(-6,2)$, where each unit is 1 yard. The designers place a second

bench by reflecting the first across the y -axis, which is the center path. Where is the second bench, and how far apart are the benches?

Problem 22: Game piece

In a board game on a coordinate grid, Maya's piece is at $(3,2)$. A card makes it rotate 90° counterclockwise about the origin, and a second card does it again. Where is the piece, and which single rotation gives the same result?

Problem 23: Wallpaper stamp

A stamp design has a vertex at $(1,1)$. Each new stamp is a translation of the previous one by 4 units right. Where is that vertex on the 4th stamp?

Problem 24: Find the original point

Point Q' is at $(-3,8)$ after a 270° counterclockwise rotation about the origin. Find the original point Q .

Problem 25: Two reflections

Reflect the point $(3,2)$ across the x -axis, then reflect the result across the y -axis. Which single rotation about the origin has the same result?

Problem 26: Legs and the right angle

Right triangle ABC has $A(1,1)$, $B(5,1)$ and $C(5,4)$. Rotate it 90° counterclockwise about the origin. Show that both legs keep their lengths and that the angle at B' is still a right angle.