The Cartesian Plane: Coordinates 1

The Cartesian coordinate system is divided into four quadrants with two perpendicular lines (axes *x* and *y*). Use Mathomat to make your grid. The squares will be 1cm x 1cm.

Reflection over the y-axis

Position Mathomat's scalene triangle (shape 36) in the first quadrant on the grid.
Angle A will be on (2:1) and angle C on (4:4).

To make the grid draw 14 parallel lines for *x*. Turn the Mathomat 90° to draw 14 lines for *y*. Use the centre arrow on Mathomat's right edge **as a perpendicular guide.**

Mark the *x* and *y* **axis**.

Step one: Pick a point of which you have the coordinates. We will use point A (2:1).
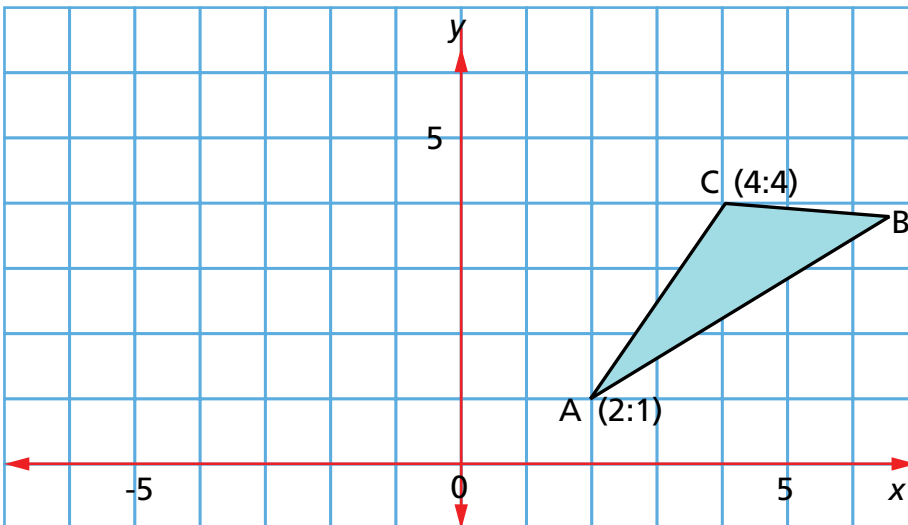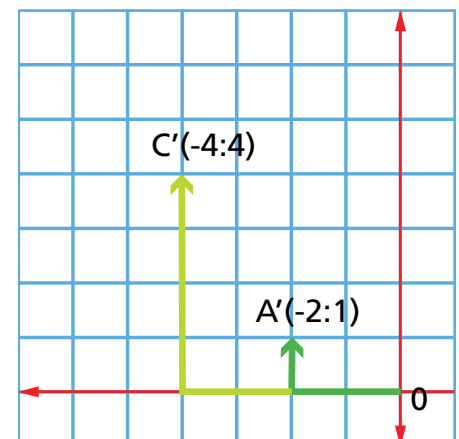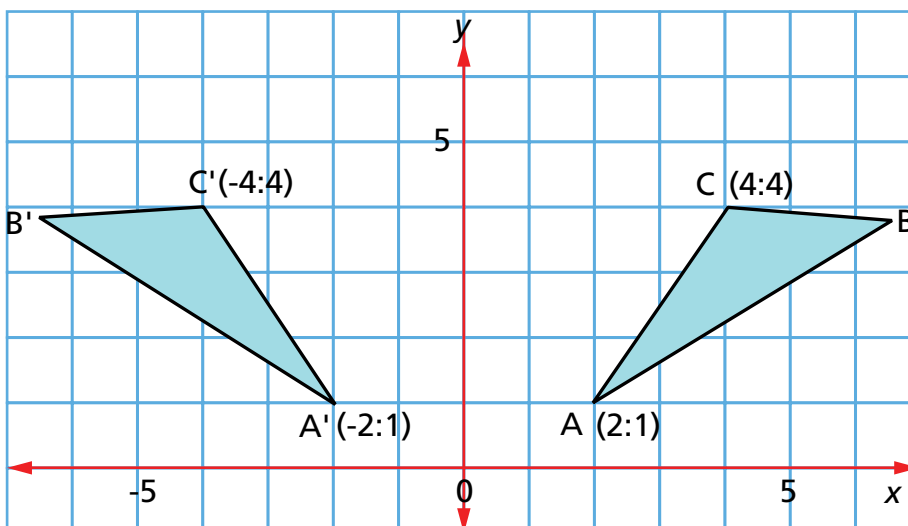
We can say that point A was obtained by moving from the origin in the following direction: 2 units to the right and 1 unit up.
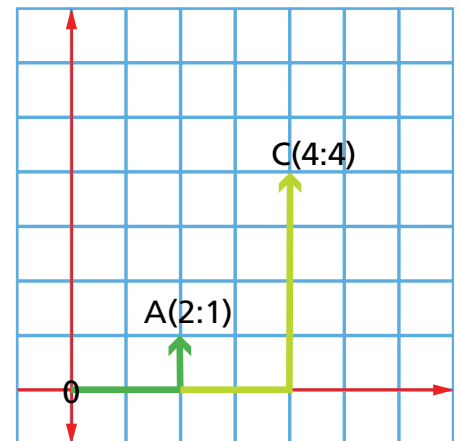
Step two: Do the inverse for the **horizontal** movements of points A and B. To get point A': from the origin, move **2** units to the left and **1** unit up.

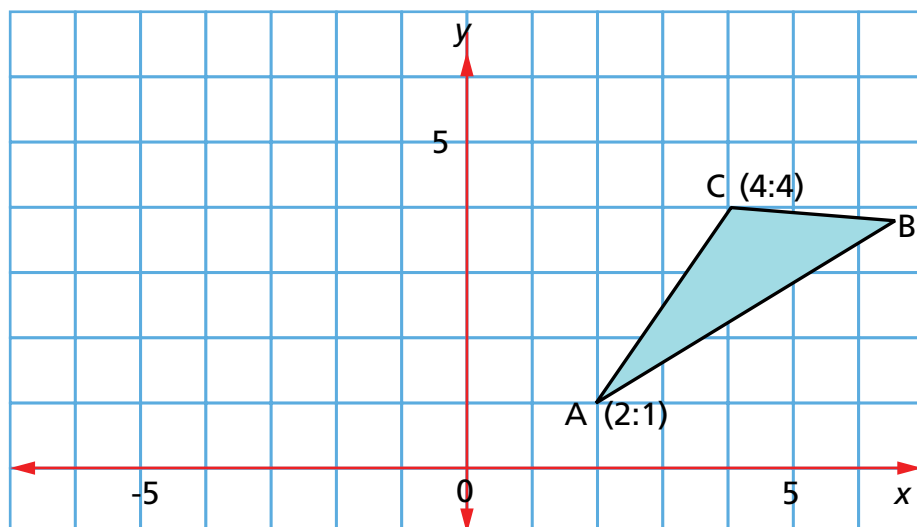**Did you notice we kept the original direction of the vertical movement?**

Step three: Mark the reflection of point A' at (-2:1) and name it. Repeat steps 1 to 3 for point C. It should read C' at (-4:4) and be positioned in the second quadrant. Turn over Mathomat to draw the triangle in the second quadrant.

Reflecting over the y-axis:

The *x*-value of the coordinate point changes to its inverse from the origin (the sign changes). The *y*-value of the coordinate point remains the same (the sign stays the same).

Reflection over the x-axis

We start with the same scalene triangle from Mathomat (shape 36) positioned in the first quadrant as before.


Let angle A be on (2:1). Let angle C be on (4:4).

**Step one**: Pick a point of which you have the coordinates. We will use Point A (2:1)

Step two: Do the inverse for the vertical movements of points A and B.

Step three: Mark the reflection of point A at (2:-1) and name the reflection A'. Repeat steps 1 to 3 for point C.

It should read C' at (4:-4) and be positioned in the fourth quadrant. Use Mathomat to draw the A' B' C' triangle.
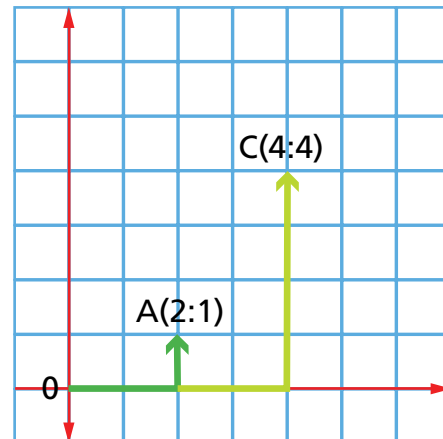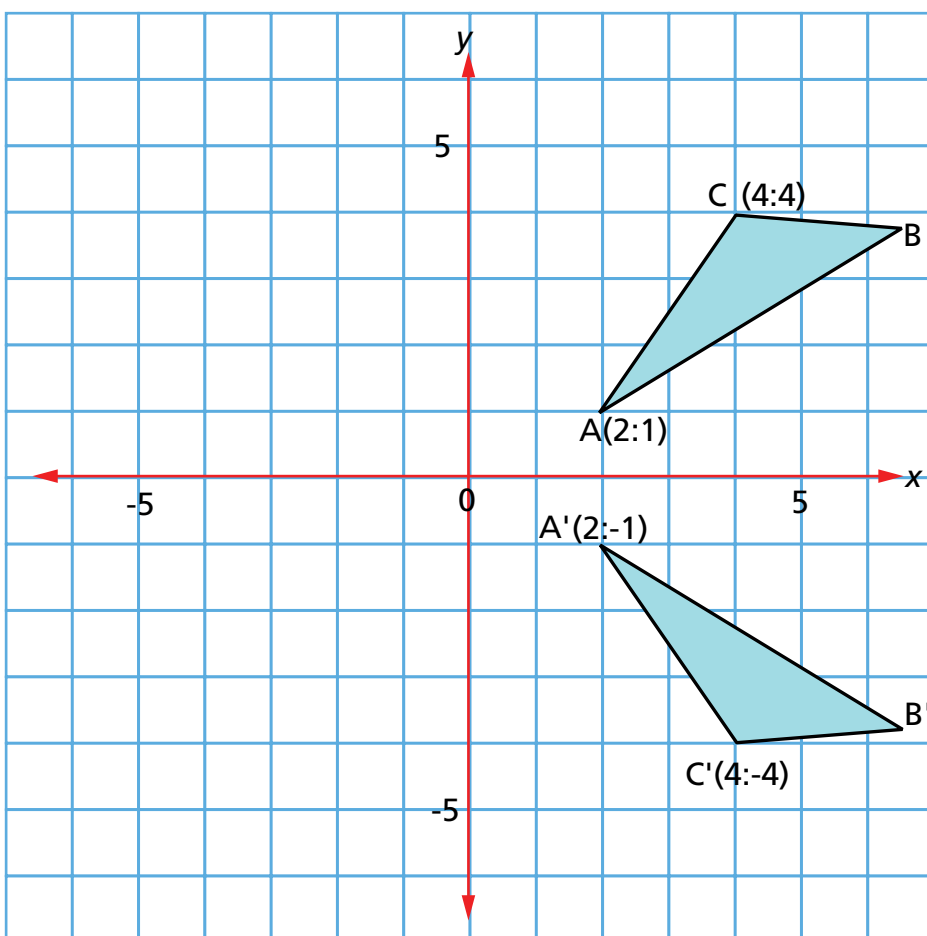
Point A is 2 units to the right and 1 unit up.
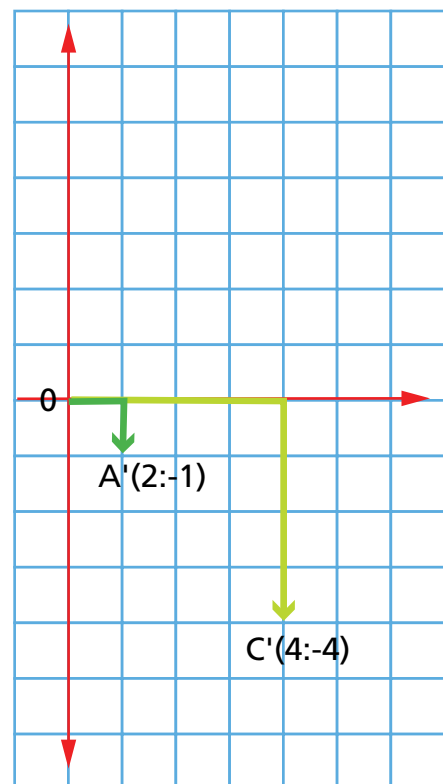
To get point A' from the origin: move 2 units to the right and 1 unit down.

Did you notice we kept the original direction of the horizontal movement?

Reflecting over the x-axis:

The y-value of the coordinate point changes to its inverse from the origin. The x-value of the coordinate point remains the same.