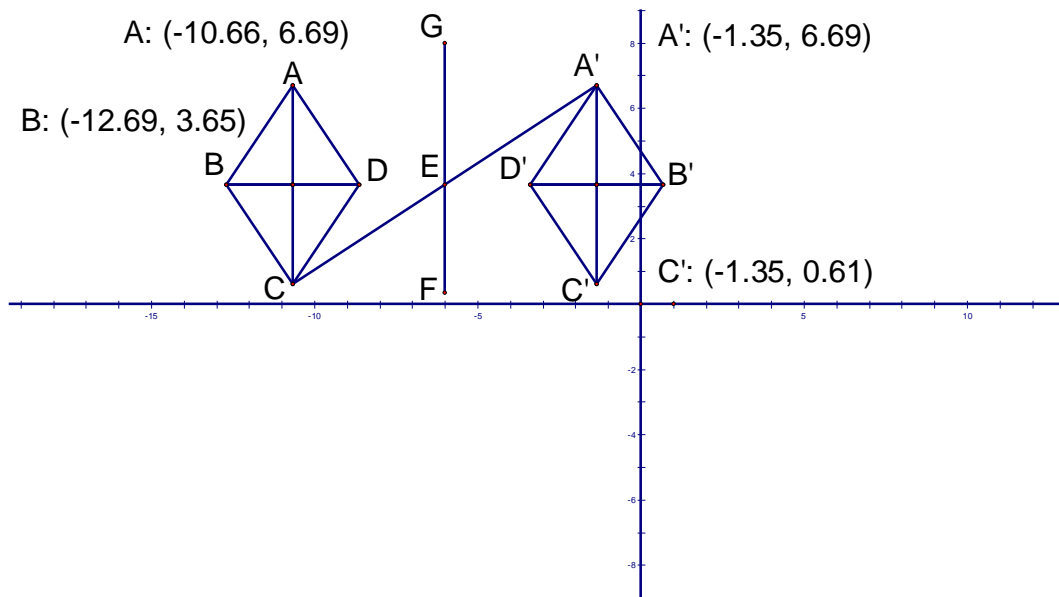


Grade 9 Mathematics Worksheet

Transformation and the cartesian plane

Questions:

- Rhombus ABCD has been reflected in line segment GF on the Cartesian plane. Make use of any algebraic method and knowledge of transformations to determine the equation of line segment CA'. You are not allowed to measure any distances.



Grade 9 Mathematics Worksheet

Solution

From knowledge of shapes (rhombi)/reflection rules/Cartesian plane interpretation/congruence, the learner should be able to see that the x-value of C is the same as the x-value of A (given) in the same way that the y-value of C is the same as the y-value of C' (given).

- Now there are two points with known coordinates that lie on the required line.
- To calculate the equation of the straight line the two points C (-10,66; 0,61) as $(x_1; y_1)$ and A' (-1,35; 6,69) as $(x_2; y_2)$.

$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} \quad \text{for the point A': } (-1,35; 6,69)$$

$$= \left(\frac{6,69 - 0,61}{-1,35 - (-10,66)} \right) \quad y = mx + c$$

$$= \left(\frac{6,08}{9,31} \right) \quad 6,69 = 0,65 (-1,35) + c$$

$$C = 7,56$$

$$\therefore y = 0,65x + 7,56$$

$$= 0,65$$

The equation of line CA' is $y = 0,67x + 7,56$

These activities start to require the learner from reasoning on a level by relying on measurement and definitions to a more proof oriented way of reasoning.