Frequently Asked Questions

Q: **How can you tell whether a shape is the image of another shape after each transformation?**

 • **a translation**   • **a reflection**   • **a rotation**

A: Each of these transformations produces an image that is congruent to the pre-image.

| Transformation	Relationship between vertices of pre-image and vertices of image	Example
translation	Each pre-image vertex is moved the same direction and the same distance. The image is oriented in the same way as the pre-image.	
reflection	The line segments that join each pre-image vertex to its image vertex are • perpendicular to the line of reflection • cut in half by the line of reflection The orientation of the image is opposite to the orientation of the pre-image.	
rotation	There is a common centre of rotation, O, from which a circle can be drawn to pass through each pre-image vertex and its image. Angles AOA', BOB', COC', and so on, are all the same. The orientation of the image depends on the angle of rotation.	

Q: **How can you tell whether figures are congruent?**

A: Congruent figures have exactly the same size and shape. This means that the measures of matching sides and angles are equal.
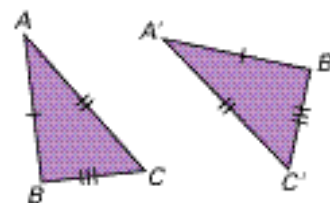
Q: **How can you tell whether figures are similar?**

A: Similar figures have the same shape, but not necessarily the same size. This means that matching angles are equal.
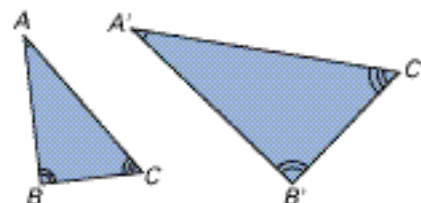
Practice Questions

(7.1) **1.** Complete each statement by filling in the boxes. (Replace ? with a number from the first ordered pair.)

  a) $(-1, -2)$ is to the right of (▢, 0) because ? > ▢.

  b) $(0, 0)$ is below $(-4,$ ▢$)$ because ? < ▢.

(7.2) **2. a)** Draw square *CDEF* with vertices $C(1, 1)$, $D(3, 2)$, $E(2, 4)$, and $F(0, 3)$.

 **b)** Translate square *CDEF* 5 units to the right. Determine the coordinates of the image vertices.

(7.2) **3. a)** Draw $\triangle ABC$ with vertices $A(0, 0)$, $B(4, 0)$, and $C(0, 3)$.

  b) Translate $\triangle ABC$ 6 units to the left and 2 units up. Determine the coordinates of the image vertices.

(7.2) **4. a)** Draw trapezoid *CDEF* with vertices $C(-1, 3)$, $D(4, 3)$, $E(6, -1)$, and $F(-3, -1)$.

  b) Translate *CDEF* so that C' has coordinates $(-10, 7)$. What are the coordinates of D', E', and F'?

(7.2) **5.** Rhombus *RSTU* is congruent to rhombus *WXYZ*. Could rhombus *RSTU* be a translation image of rhombus *WXYZ*? Why or why not? Can you be sure that rhombus *RSTU* is a translation image of rhombus *WXYZ*? Why or why not?

(7.3) **6. a)** Draw $\triangle ABC$ with vertices $A(-4, 8)$, $B(-8, 3)$, and $C(-3, 3)$.

 **b)** Reflect $\triangle ABC$ in the *y*-axis. What are the coordinates of the reflected image?

7. Quadrilateral *WXYZ* is reflected in line *AB*. Determine the distances between vertices *W*, *X*, *Y*, and *Z* and their images. (7.3)
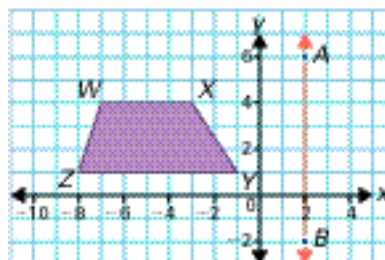
8. a) Draw $\triangle LMN$ with vertices $L(-5, 2)$, $M(-2, 4)$, and $N(0, 1)$. (7.4)

  b) Rotate $\triangle LMN$ 180° cw about point *L*. Label the coordinates of the image.

9. a) Draw $\triangle ABC$ with vertices $A(4, 2)$, $B(3, -3)$, and $C(1, -2)$. (7.4)

  b) Rotate $\triangle ABC$ 90° ccw about the origin. What are the coordinates of the vertices of the image?

10. Describe a single transformation that could move parallelogram *HIJK* to each image. If possible, give more than one answer. (7.4)

  a) image A   **b)** image B
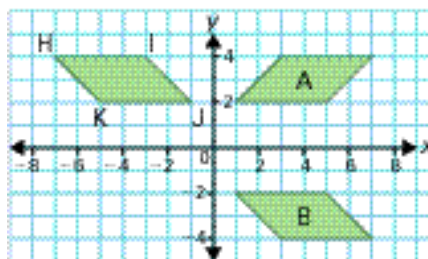
11. Draw a triangle with two angles of 70° and one angle of 40°. Draw another triangle with the same angle measurements. Must the second triangle be congruent to the first triangle? Must the second triangle be similar to the first triangle? Use diagrams to illustrate your answers. (7.5)