

# Assignment

## LESSON 6: Every Which Way

### Write

Draw and label a pair of congruent triangles. Write a congruence statement for the triangles, and then write congruence statements for each set of corresponding sides and angles.

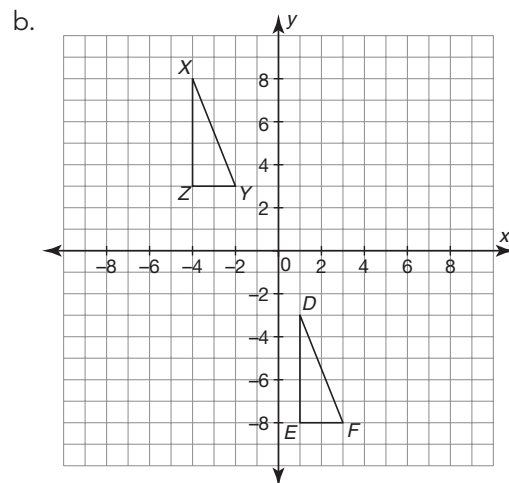
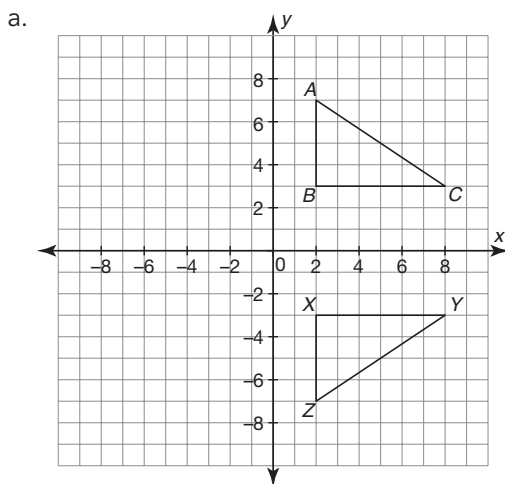
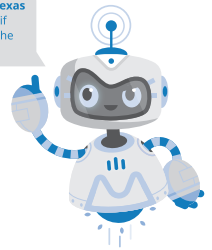
### Remember

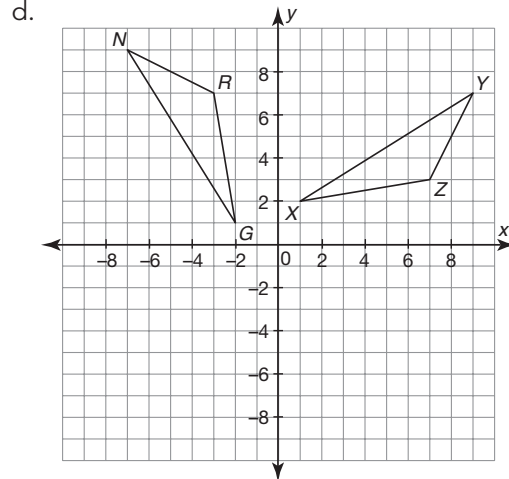
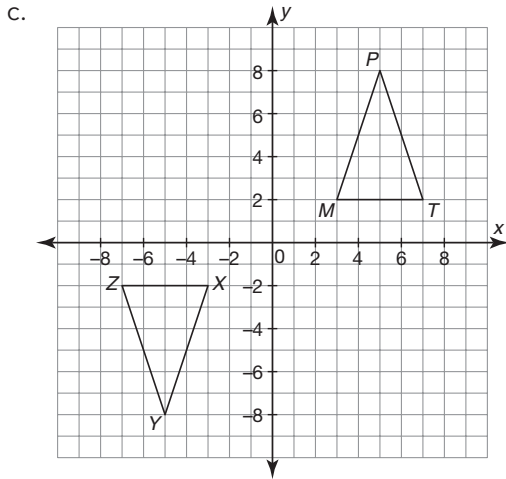
A single rigid motion or a sequence of rigid motions produces congruent figures. There is often more than one sequence of transformations that can be used to verify that two figures are congruent.

### Practice

- Triangle  $ABC$  has coordinates  $A(1, -8)$ ,  $B(5, -4)$ , and  $C(8, -9)$ .
  - Describe a transformation that can be performed on  $\triangle ABC$  that will result in a triangle in the first quadrant.
  - Perform the transformation and name the new  $\triangle DEF$ .
  - List the coordinates for the vertices for  $\triangle DEF$ .
  - Write a triangle congruence statement for the triangles.
- Triangle  $ABC$  has coordinates  $A(1, -8)$ ,  $B(5, -4)$ , and  $C(8, -9)$ .
  - Describe a transformation that can be performed on  $\triangle ABC$  that will result in a triangle in the third quadrant.
  - Perform the transformation and name the new  $\triangle DEF$ .
  - List the coordinates for the vertices for  $\triangle DEF$ .
  - Write a triangle congruence statement for the triangles.
- Identify the transformation used to create  $\triangle XYZ$  in each.

Visit [livehint.com/texas](https://livehint.com/texas) or use this QR code if you need a hint on the Practice questions.



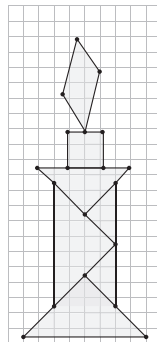
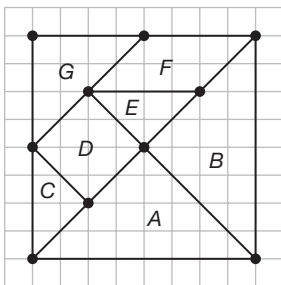


4. Use the coordinates to determine the transformation or sequence of transformations used to map the first triangle onto the second triangle.

- Triangle  $ABC$  with coordinates  $A(-8, 1)$ ,  $B(-4, 6)$ , and  $C(0, 3)$  maps onto  $\triangle XYZ$  with coordinates  $X(-1, -8)$ ,  $Y(-6, -4)$ , and  $Z(-3, 0)$ .
- Triangle  $PRG$  with coordinates  $P(2, 8)$ ,  $R(-7, 5)$ , and  $G(2, 5)$  maps onto  $\triangle YOB$  with coordinates  $Y(-2, 8)$ ,  $O(7, 5)$ , and  $B(-2, 5)$ .
- Triangle  $JCE$  with coordinates  $J(-6, 0)$ ,  $C(-4, -2)$ , and  $E(0, 2)$  maps onto  $\triangle RAN$  with coordinates  $R(6, -3)$ ,  $A(4, -1)$ , and  $N(0, -5)$ .
- Triangle  $EFG$  with coordinates  $E(2, -1)$ ,  $F(8, -2)$ , and  $G(8, -5)$  maps onto  $\triangle ZOQ$  with coordinates  $Z(-6, 1)$ ,  $O(0, 2)$ , and  $Q(0, 5)$ .

## Stretch

The tangram is a popular Chinese puzzle that consists of seven geometric shapes. The shapes are composed into figures using all seven pieces. The seven pieces fit together to form a square. Determine the transformations of each shape required to create the candle pictured.



## Review

- Triangle  $HOP$  has coordinates  $H(2, 1)$ ,  $O(-3, 4)$ , and  $P(5, 7)$ . Determine the coordinates of the image of  $\triangle HOP$  after each rotation.
  - Rotation  $90^\circ$  clockwise about the origin
  - Rotation  $90^\circ$  counterclockwise about the origin
  - Rotation  $180^\circ$  about the origin
- Combine like terms to rewrite each expression.
  - $(4\frac{1}{2}x - 3) + (-2 + 1\frac{3}{4}x)$
  - $4 - (2.3x - 7)$