Warm Up

1. For $A(2, 7)$ and $B(7, -5)$, find the length of $AB$.

2. What point is six units to the right and one unit up from $(3, 5)$?

3. Are these triangles congruent? If so, how do you know?

4-8 Congruence Transformations

- transformation - moving or changing a figure to create a new figure
- image - new figure
translation — moving every point of a figure the same distance in the same direction

reflection — flipping a figure across a line of reflection
rotation - turning a figure around the center of rotation

Ex 1 Name the type of transformation demonstrated in each picture.

Translation

Reflection

Rotation
Ex. 2  Describe the translation in words.

\((x, y) \rightarrow (x + 7, y - 5)\)

Translate the figure
7 units right, 5 units down

Ex. 3  Use coordinate notation to describe the translation.

3 units left, 4 units up

\((x, y) \rightarrow (x-3, y+4)\)
Ex 4  Figure WXYZ has vertices W(-1, 2), X(2, 3), Y(5, 0), and Z(1, -1). Sketch WXYZ and its image after the translation \((x, y) \rightarrow (x - 1, y + 3)\).

Ex 5  Figure ABCD has vertices A(5, 7), B(8, 9), C(6, 1), and D(2, 3). Sketch ABCD and its image after the translation \((x, y) \rightarrow (x - 7, y - 4)\).
Ex 6  Graph \( \overline{PQ} \) and \( \overline{RS} \). Tell whether \( \overline{RS} \) is a rotation of \( \overline{PQ} \) about the origin. If so, give the angle and direction of rotation.

\[ P(4, 2) \quad Q(5, 1) \]
\[ R(-2, 4) \quad S(-1, 5) \]

Yes
90°
counterclockwise