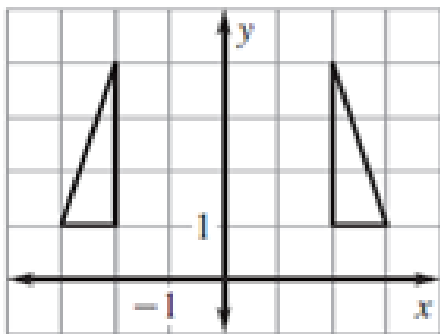


4.8 Warm-Up:

1. Find the length of \overline{AB} for $A(2, 7)$ and $B(7, -5)$.

2. What point is 6 units to the right of $(3, 5)$? $(9, 5)$

3. Are these triangles congruent?



$$\begin{aligned} 1. & \sqrt{(7-2)^2 + (7+5)^2} \\ & \sqrt{5^2 + 12^2} \\ & \sqrt{25 + 144} \\ & \sqrt{169} = 13 \end{aligned}$$

3. Yes.

transformation - change from one shape to a new location

image - new image

translation - slide (all pts move same distance)

reflection - mirror image over x- or y-axis

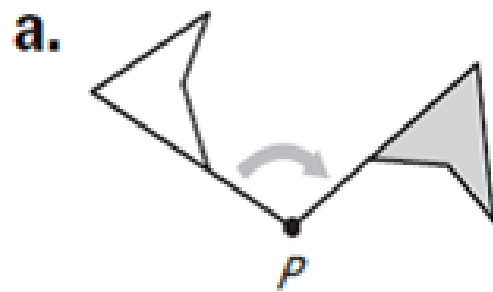
rotation - turn (degree of rotation & direction) 90° clockwise

transformation notation -

$(x, y) \rightarrow (x+a, y+b)$ - slide

$(x, y) \rightarrow (x, -y)$ reflect over ~~x~~-axis

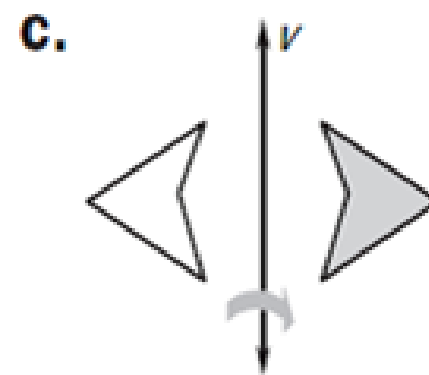
Name the type of transformation demonstrated in each picture.



rotation
about a point



translation
in a straight path



reflection
in a vertical
line

congruence transformation - changes position, but not size and shape

Coordinate Notation for a Translation

You can describe a translation by the notation

$$(x, y) \rightarrow (x + a, y + b)$$

which shows that each point (x, y) of the blue figure is translated horizontally a units and vertically b units.

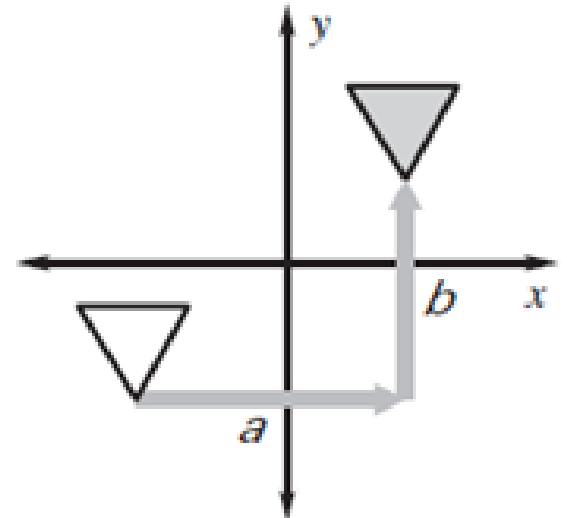
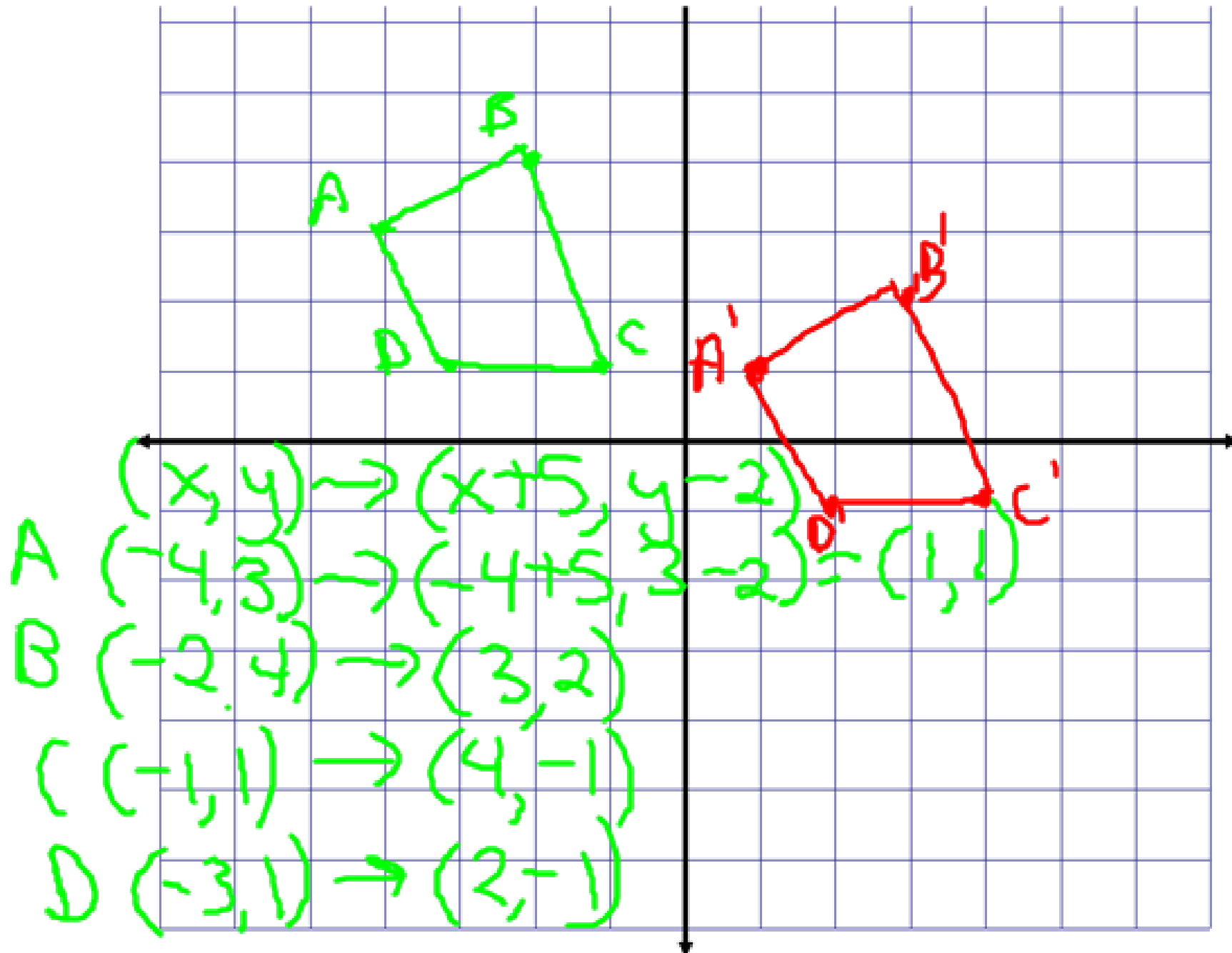
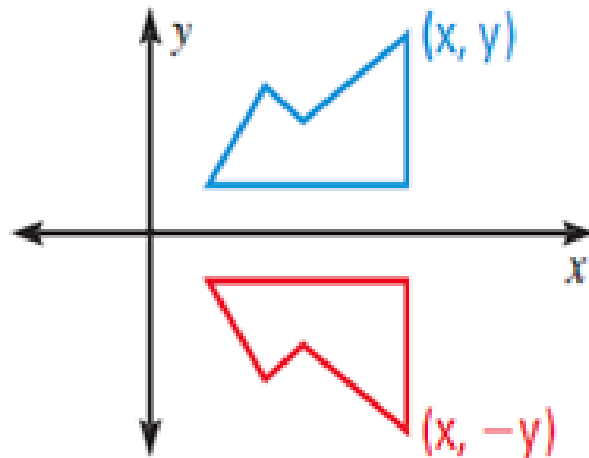


Figure $ABCD$ has the vertices $A(-4, 3)$, $B(-2, 4)$, $C(-1, 1)$, and $D(-3, 1)$. Sketch $ABCD$ and its image after the translation $(x, y) \rightarrow (x + 5, y - 2)$.



Coordinate Notation for a Reflection

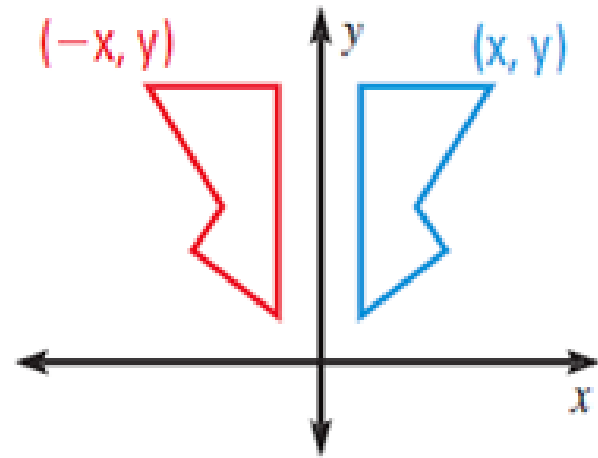
Reflection in the x -axis



Multiply the y -coordinate by -1 .

$$(x, y) \rightarrow (x, -y)$$

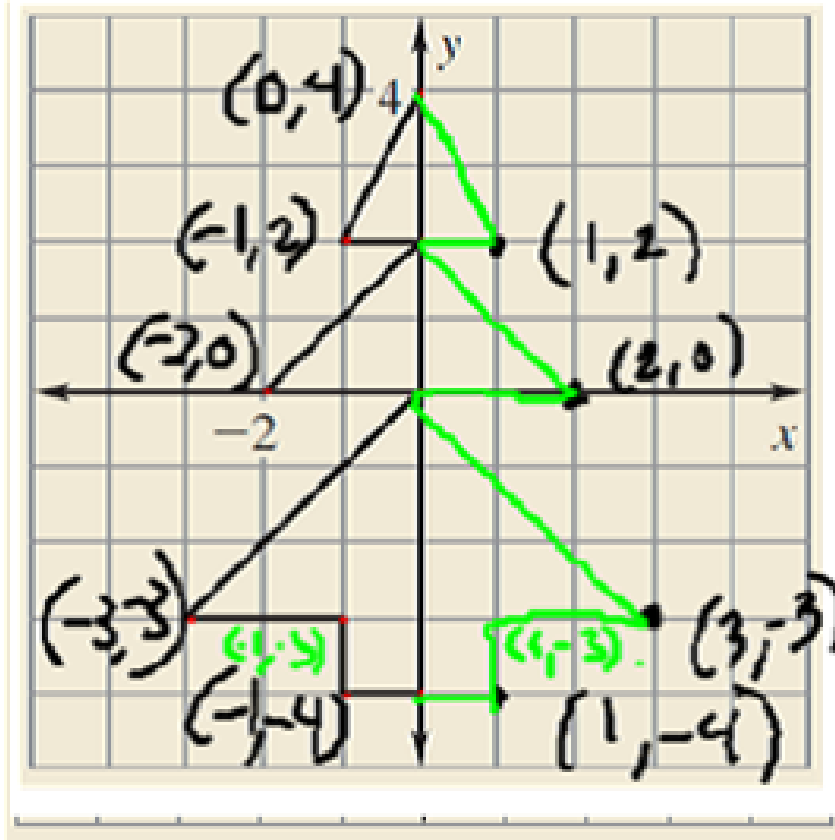
Reflection in the y -axis



Multiply the x -coordinate by -1 .

$$(x, y) \rightarrow (-x, y)$$

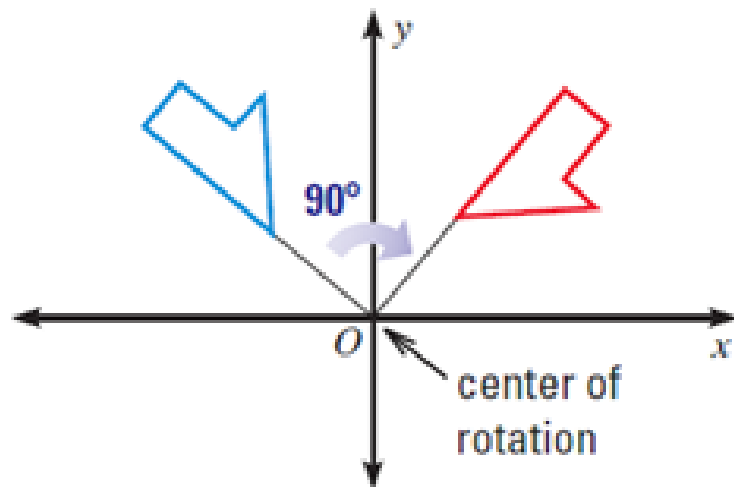
You are drawing a pattern for a festive design. Use a reflection in the y -axis to draw the other half of the pattern.



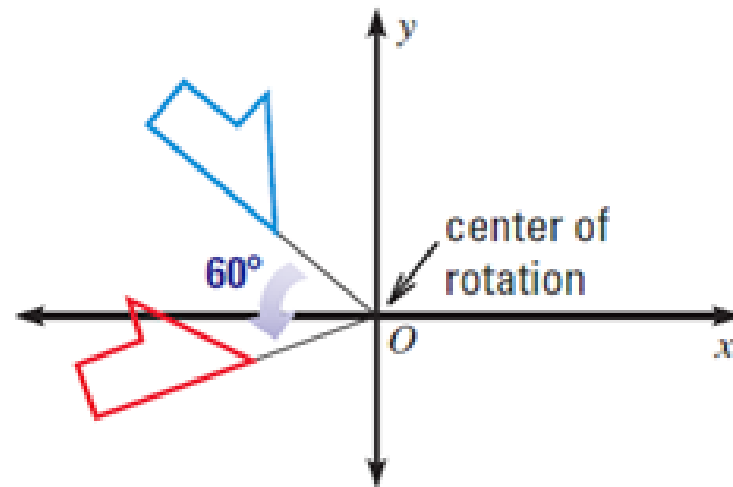
$$(x, y) \rightarrow (-x, y)$$

- rotations:
- clockwise or counterclockwise
 - center of rotation is the origin
 - corresponding parts of the figures are the same distance from the origin

90° clockwise rotation



60° counterclockwise rotation



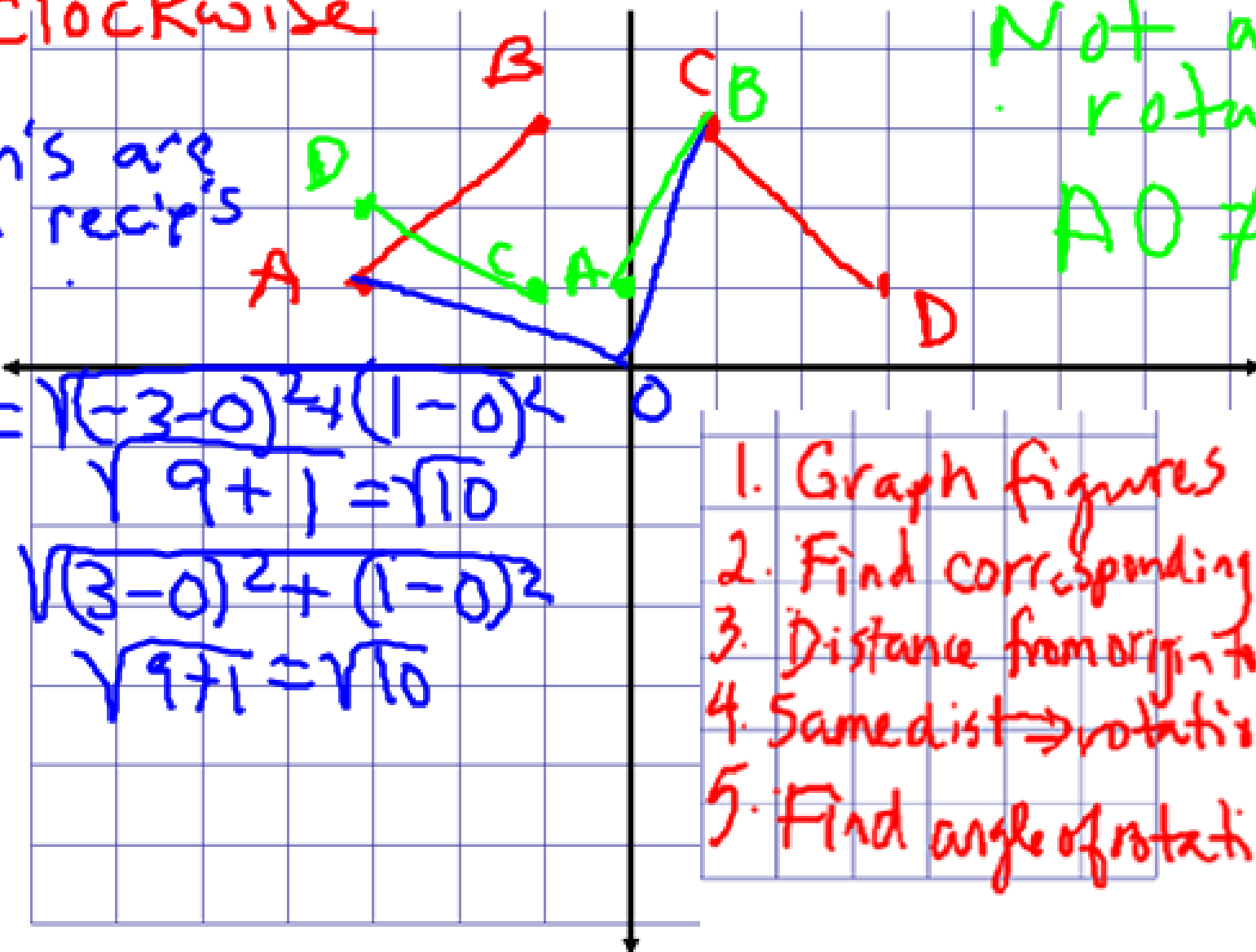
Graph \overline{AB} and \overline{CD} . Tell whether \overline{CD} is a rotation of \overline{AB} about the origin. If so, give the angle and direction of rotation.

a. $A(-3, 1), B(-1, 3), C(1, 3), D(3, 1)$

b. $A(0, 1), B(1, 3), C(-1, 1), D(-3, 2)$

90° clockwise

m's are opp. recip's



Not a rotation
 $AO \neq CO$

$$AO = \sqrt{(-3-0)^2 + (1-0)^2}$$

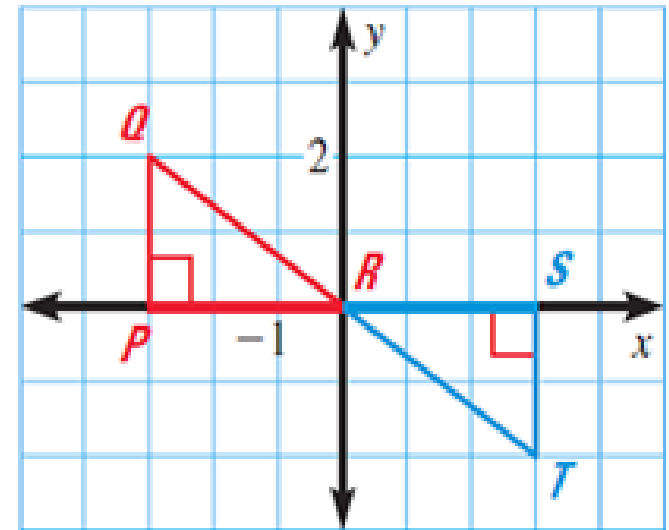
$$\sqrt{9+1} = \sqrt{10}$$

$$CO = \sqrt{(3-0)^2 + (1-0)^2}$$

$$\sqrt{9+1} = \sqrt{10}$$

1. Graph figures
2. Find corresponding part
3. Distance from origin to point
4. Same dist \Rightarrow rotation
5. Find angle of rotation.

4. Tell whether $\triangle PQR$ is a rotation of $\triangle STR$. If so, give the angle and direction of rotation.
5. Show that $\triangle PQR \cong \triangle STR$ to verify that the transformation is a congruence transformation.



4. 180° rotation
counterclockwise or clockwise

5 if use HL show $QP = TS$ & $QR = RT$
 $\angle QRP = \angle SRT$
 if ASA right \angle 's, $\angle QRP \cong \angle SRT$ by Vert
 \angle 's & $PR = RS$.
 if SAS show $RS = PR$, $ST = QP$, $\angle P = \angle S$

Homework:

p 276-279

#'s 1-9, 14-30 even, 40, 51

Quiz next time!!!

Over 4.5-4.8