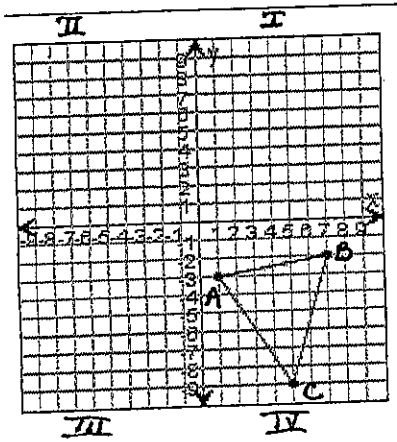
Rotations

Three Different Types:

90° clockwise rotation



- In which quadrant will the image lie?
- Coordinates

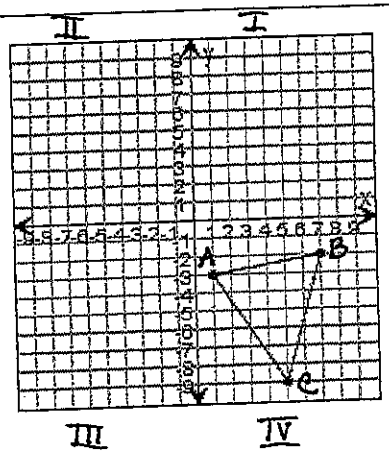
A (1, -3) B(7, -2) C(5, -9)

image: A ( ) B( ) C( )

Rule: (___ , ___)

In words:

90° Counter-clockwise rotation



* In which quadrant will the image lie?
* Coordinates

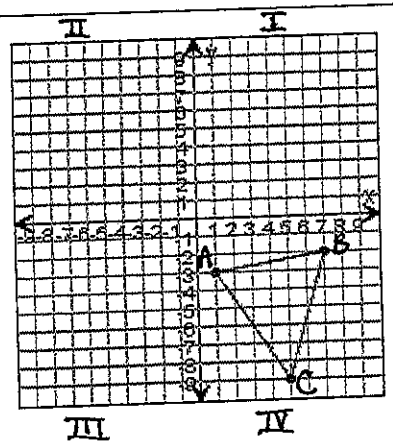
A (1, -3) B(7, -2) C(5, -9)

image: A ( ) B( ) C( )

Rule: (___ , ___)

In words:

180° rotation



* In which quadrant will the image lie?
* Coordinates

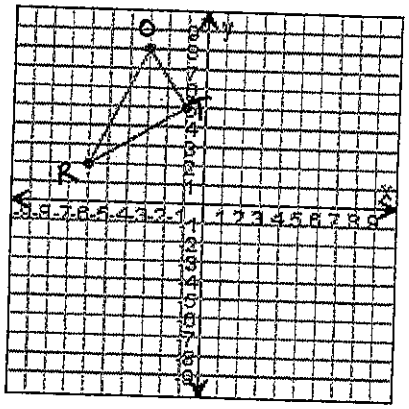
A (1, -3) B(7, -2) C(5, -9)

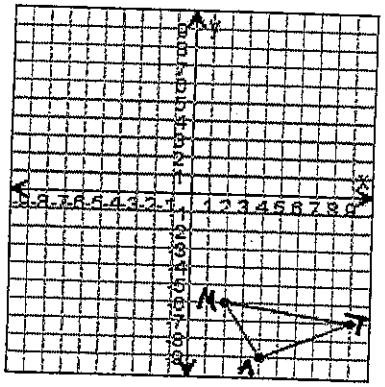
image: A( ) B( ) C( )

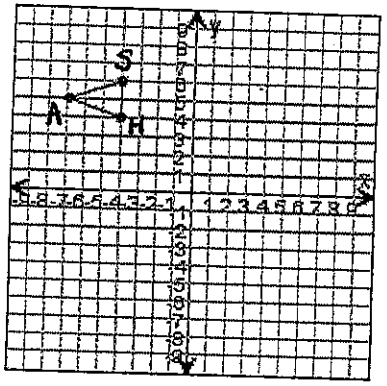
Rule: (___ , ___)

In words:

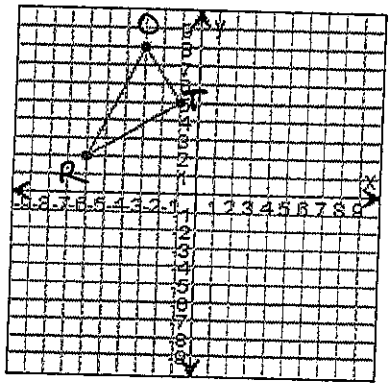
90° Clockwise rotation

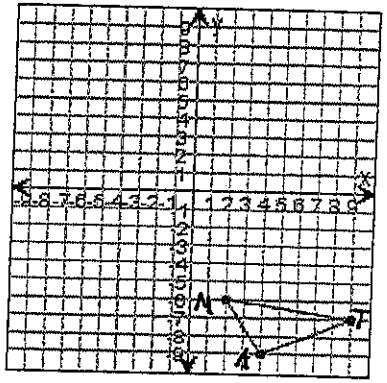


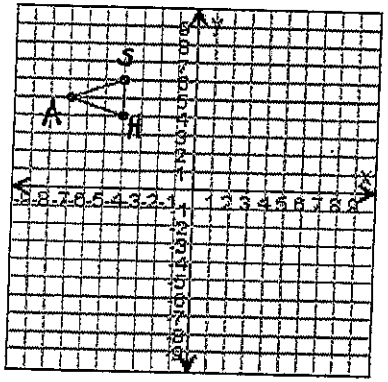




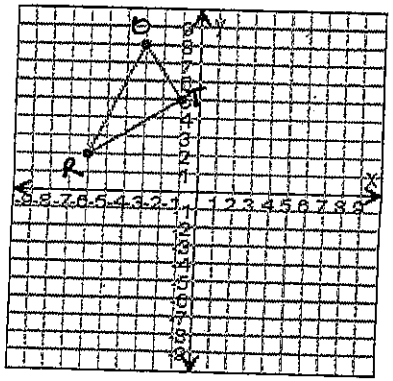
90° Counter-clockwise rotation

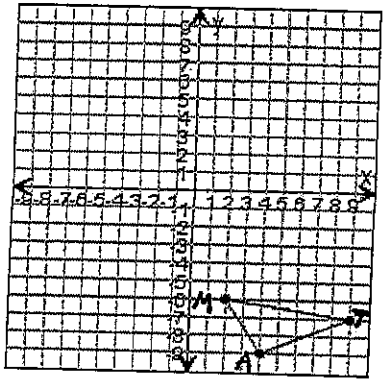


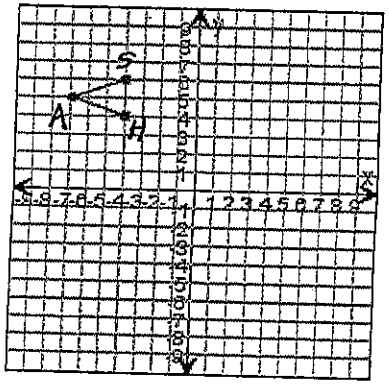




180° rotation







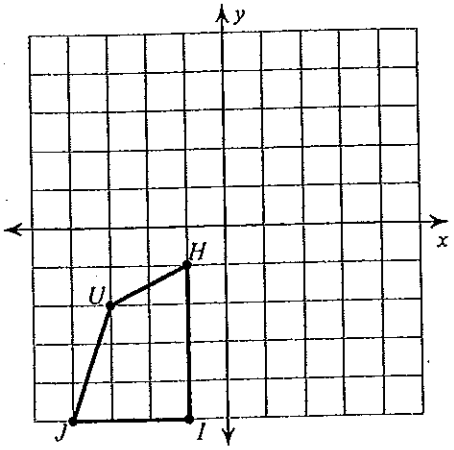
Transformations Unit

Name_____

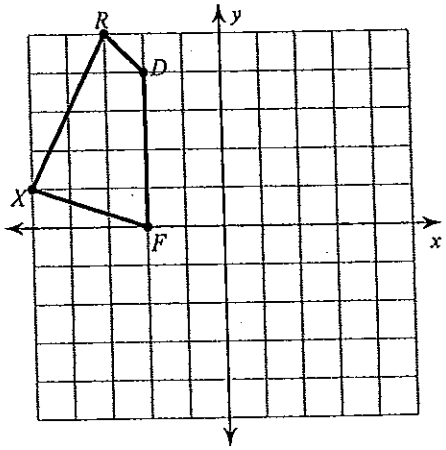
Rotations- 90 degree counter-clockwise

Graph the image of the figure after a 90 degree counter-clockwise rotation.

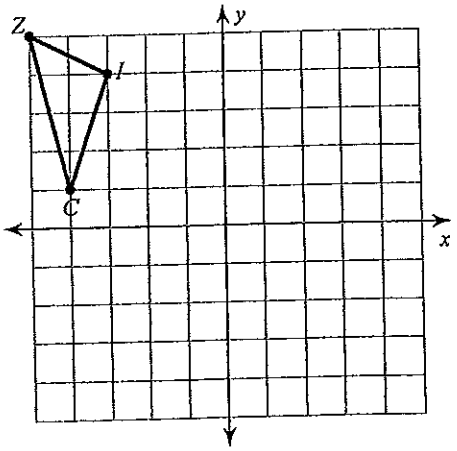
1) rotation 90° counterclockwise about the origin



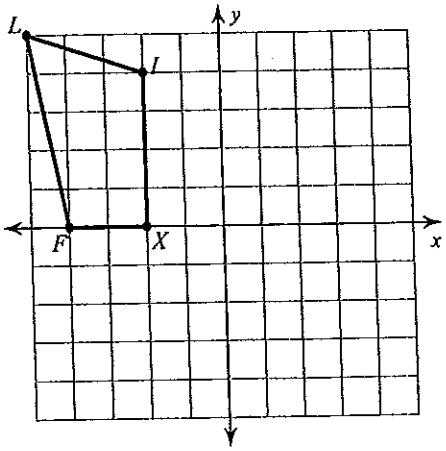
2) rotation 90° counterclockwise about the origin



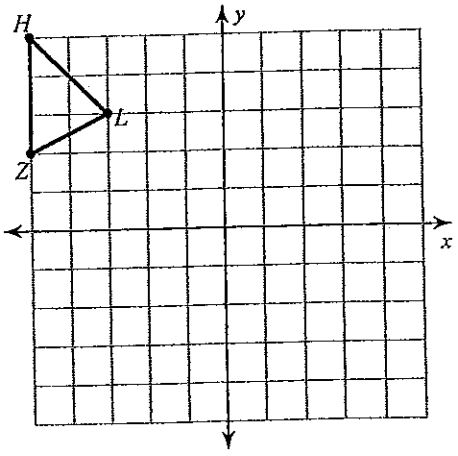
3) rotation 90° counterclockwise about the origin



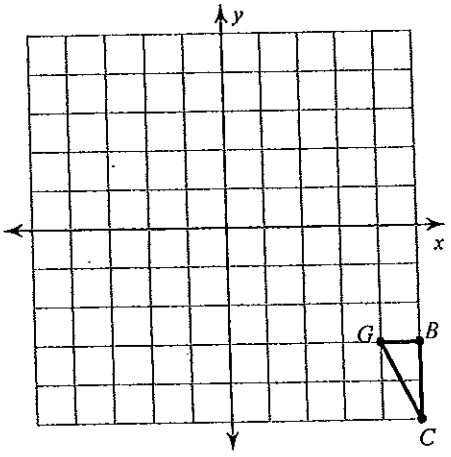
4) rotation 90° counterclockwise about the origin



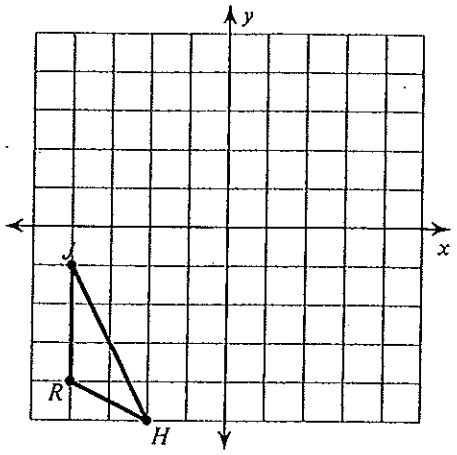
5) rotation 90° counterclockwise about the origin



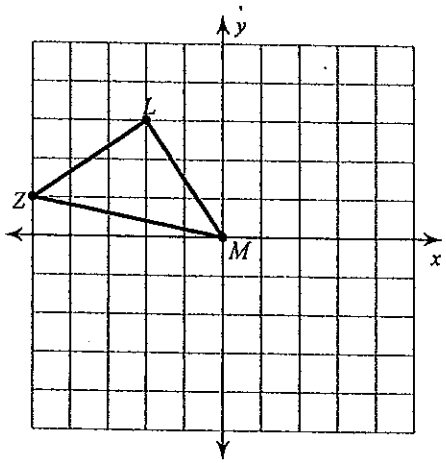
6) rotation 90° counterclockwise about the origin



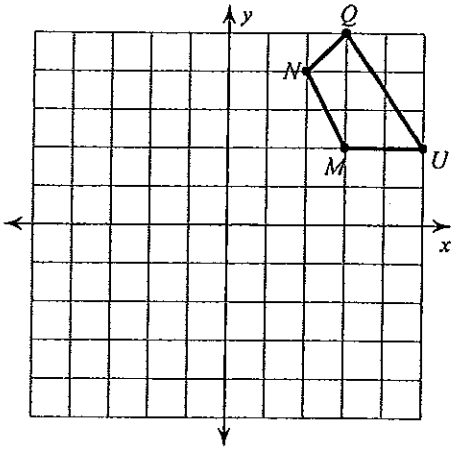
7) rotation 90° counterclockwise about the origin



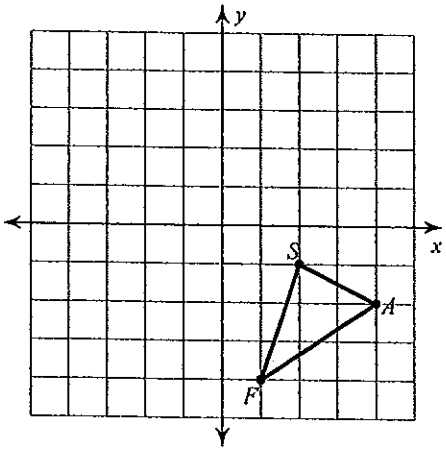
8) rotation 90° counterclockwise about the origin



9) rotation 90° counterclockwise about the origin



10) rotation 90° counterclockwise about the origin

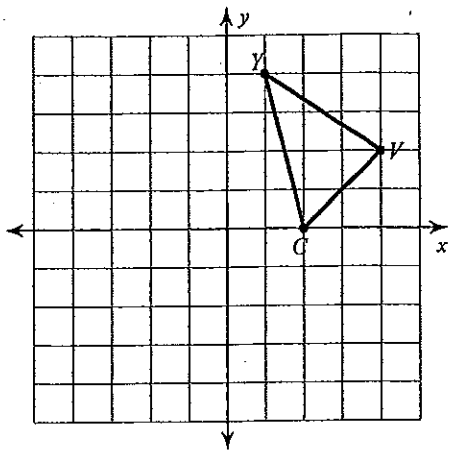


Transformations Unit Name_____

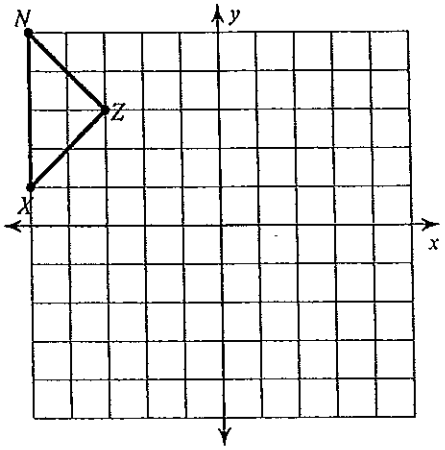
Rotations- 90 degree clockwise

Graph the image of the figure after a 90 degree clockwise rotation.

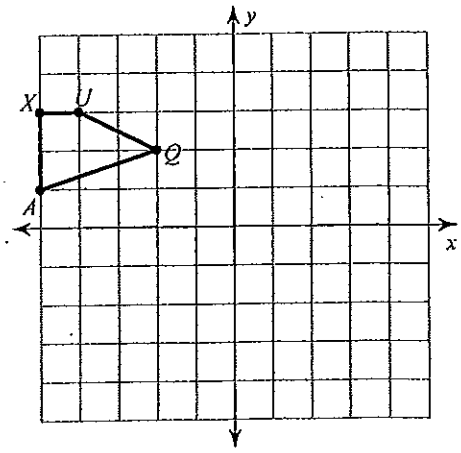
1) rotation 90° clockwise about the origin



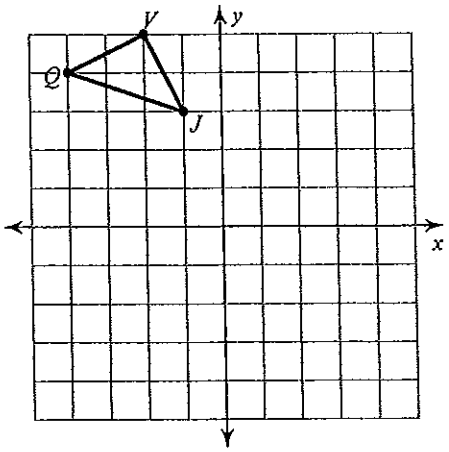
2) rotation 90° clockwise about the origin



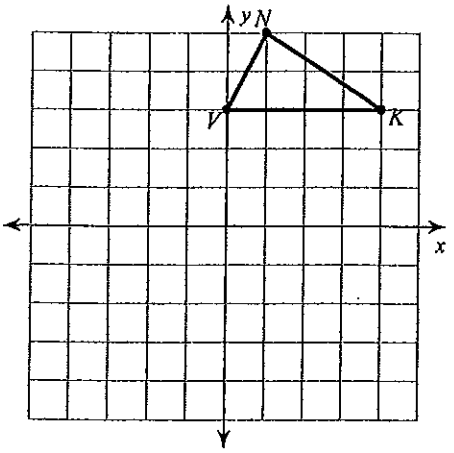
3) rotation 90° clockwise about the origin



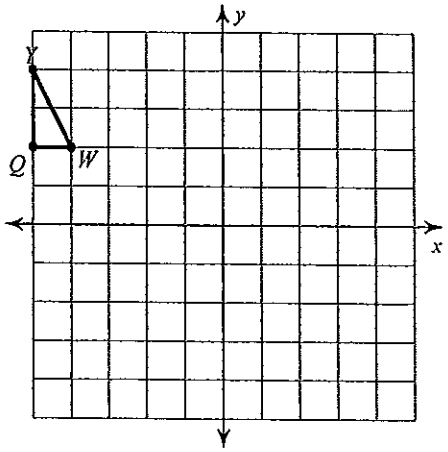
4) rotation 90° clockwise about the origin



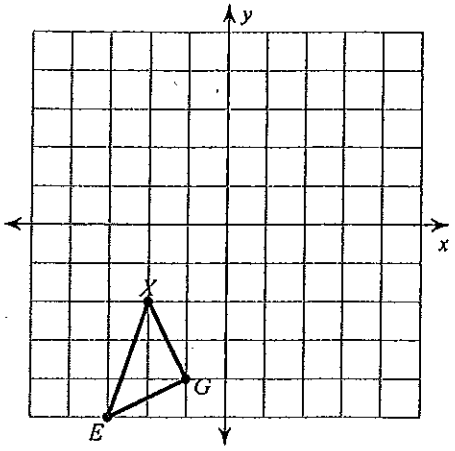
5) rotation 90° clockwise about the origin



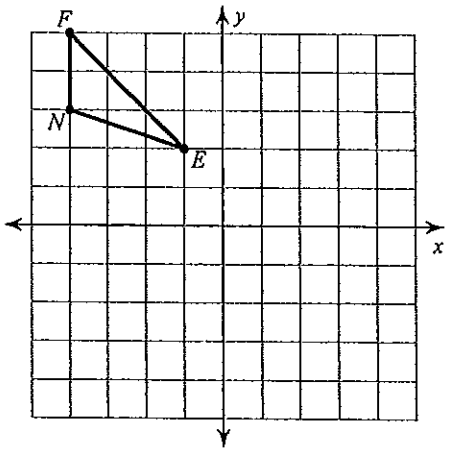
6) rotation 90° clockwise about the origin



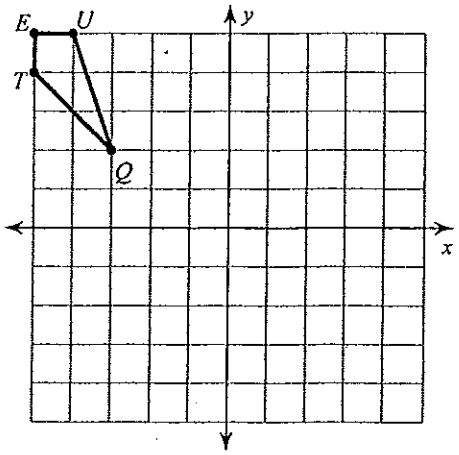
7) rotation 90° clockwise about the origin



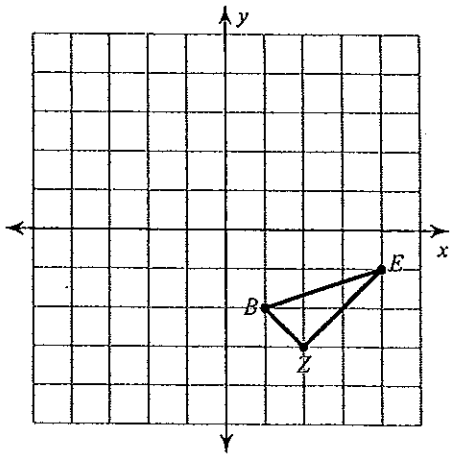
8) rotation 90° clockwise about the origin



9) rotation 90° clockwise about the origin



10) rotation 90° clockwise about the origin

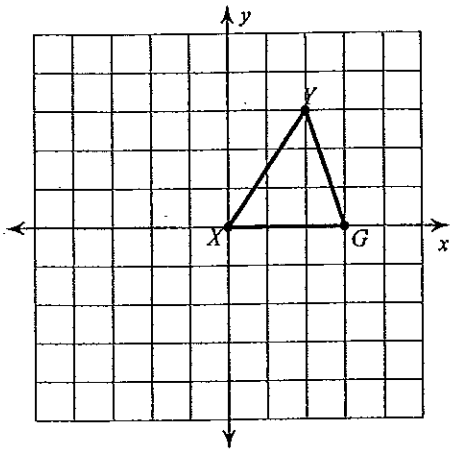


Transformations Unit Name_____

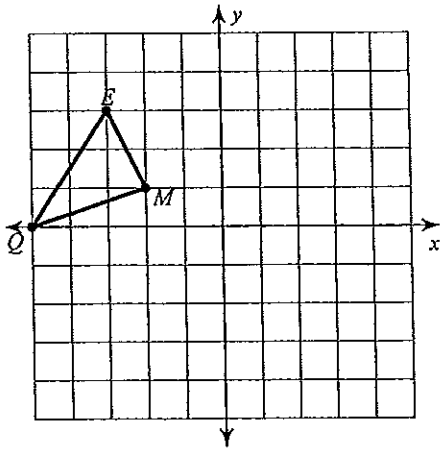
Rotations- 180 degree

Graph the image of the figure after a 180 degree rotation.

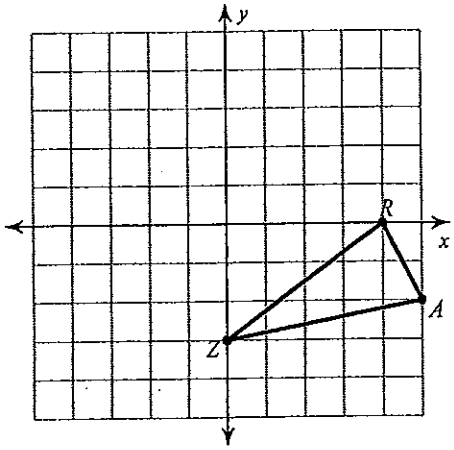
1) rotation 180° about the origin



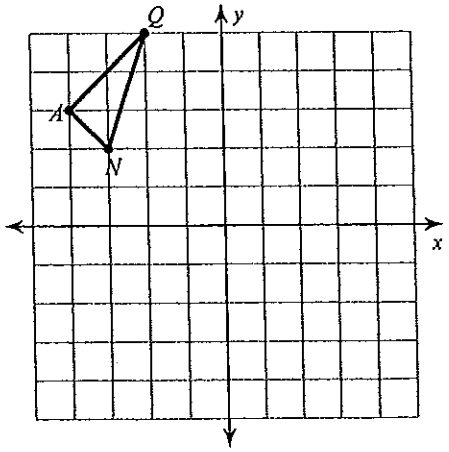
2) rotation 180° about the origin



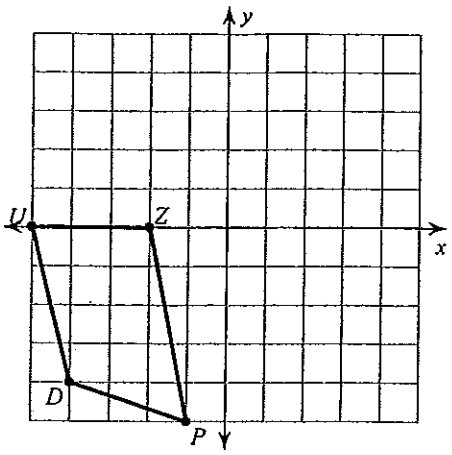
3) rotation 180° about the origin



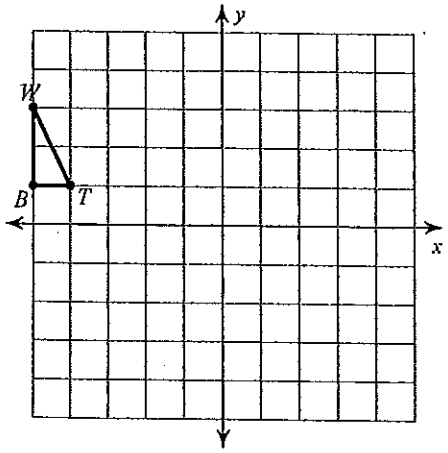
4) rotation 180° about the origin



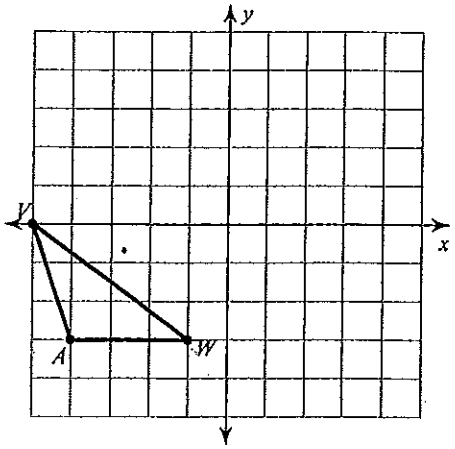
5) rotation 180° about the origin



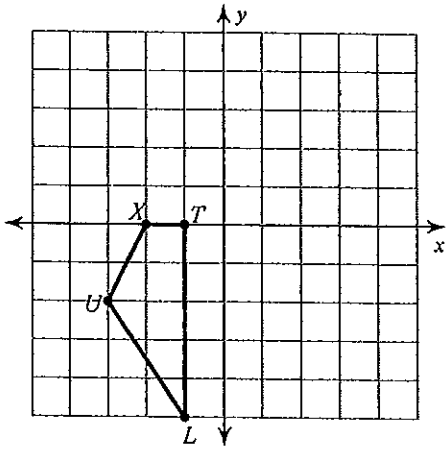
6) rotation 180° about the origin



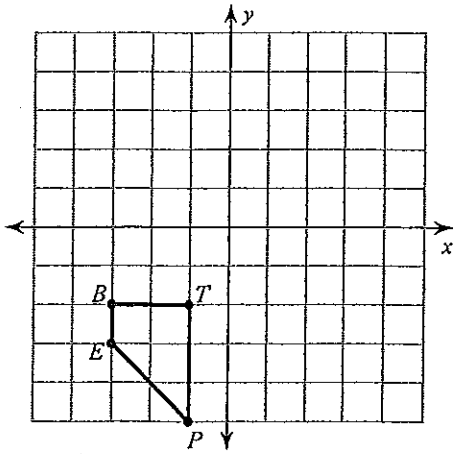
7) rotation 180° about the origin



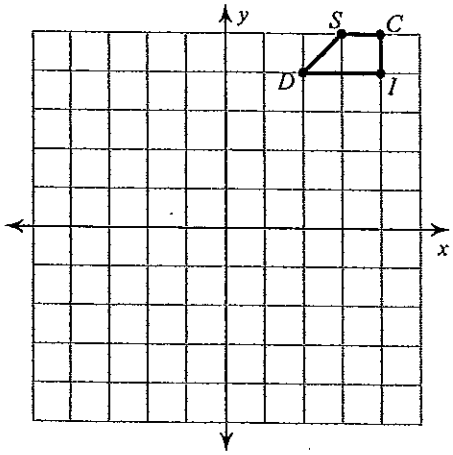
8) rotation 180° about the origin



9) rotation 180° about the origin



10) rotation 180° about the origin

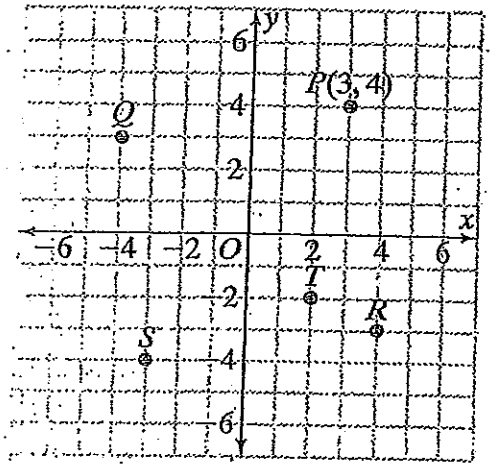


Rotations

Practice

Circle the letter of the best answer.

Use the figure below for Questions 1–3.



1. Which point is the image of P after a 90° clockwise rotation about the origin?

   A point Q C point T

   B point S D point R

2. Which point is the image of P after a 90° counterclockwise rotation about the origin?

   F point S H point R

   G point Q J point T

3. Which point is the image of P after a 180° rotation about the origin?

   A $(4, 3)$ C $(4, -3)$

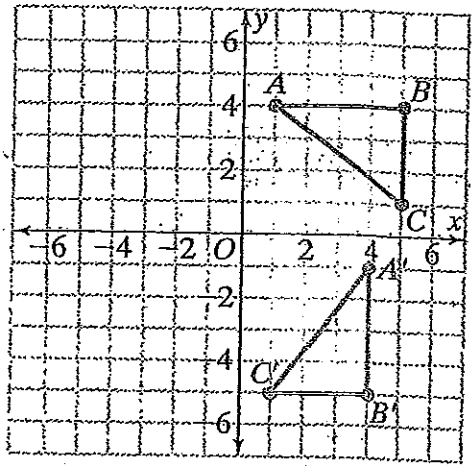
   B $(-3, -4)$ D $(-4, 3)$

4. Point $L(1, 0)$ is rotated 90° clockwise about the origin. Which point below is the image of L?

   F $(0, 1)$ H $(-1, 0)$

   G $(0, -1)$ J $(1, -1)$

Use the figure below for Questions 5–6.



5. How is $\triangle ABC$ transformed into $\triangle A'B'C'$?

   A 90° clockwise rotation about the origin

   B 90° counterclockwise rotation about the origin

   C 180° rotation about the origin

   D 360° rotation about the origin

6. Which rule below describes the transformation of $\triangle ABC$ above?

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

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

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

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

7. Point $L(0, 3)$ is rotated 90° counterclockwise about the origin. The image $L'(-3, 0)$ is then rotated 90° clockwise. Which point below is the image of L'?

   A $(3, 0)$ C $(-3, 0)$

   B $(0, 3)$ D $(0, -3)$

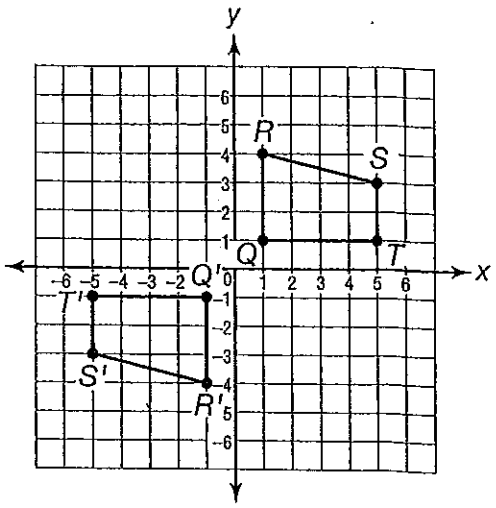
Coached Example

Trapezoid *QRST* is rotated 180° counterclockwise about the origin to create trapezoid *Q'R'S'T'*.

Which sides of the trapezoids are congruent? Which sides are parallel?

Trapezoid *Q'R'S'T'* is a rotation of trapezoid *QRST*.

So, the figures are the same shape and the same size, or _____.



How many units long is $\overline{QR}$? _____

How many units long is $\overline{Q'R'}$? _____

How many units long is $\overline{ST}$? _____

How many units long is $\overline{S'T'}$? _____

How many units long is $\overline{TQ}$? _____

How many units long is $\overline{T'Q'}$? _____

The corresponding sides of congruent figures are _____.

$\overline{QR}$ corresponds to _____, so $\overline{QR} \cong$ _____.

$\overline{RS}$ corresponds to _____, so $\overline{RS} \cong$ _____.

$\overline{ST}$ corresponds to _____, so $\overline{ST} \cong$ _____.

$\overline{TQ}$ corresponds to _____, so $\overline{TQ} \cong$ _____.

Which sides of trapezoid *QRST* are parallel? _____

So, which sides of trapezoid *Q'R'S'T'* are parallel? _____

$\overline{QR} \cong$ _____, $\overline{RS} \cong$ _____, $\overline{ST} \cong$ _____, and $\overline{TQ} \cong$ _____.

In trapezoid *QRST*, _____ is parallel to _____.

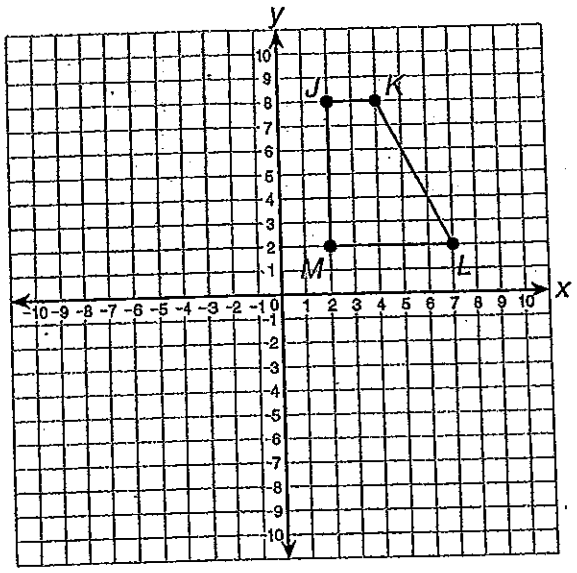
In trapezoid *Q'R'S'T'*, _____ is parallel to _____.

Performance Indicators: 8.G.7, 8.G.8, 8.G.12

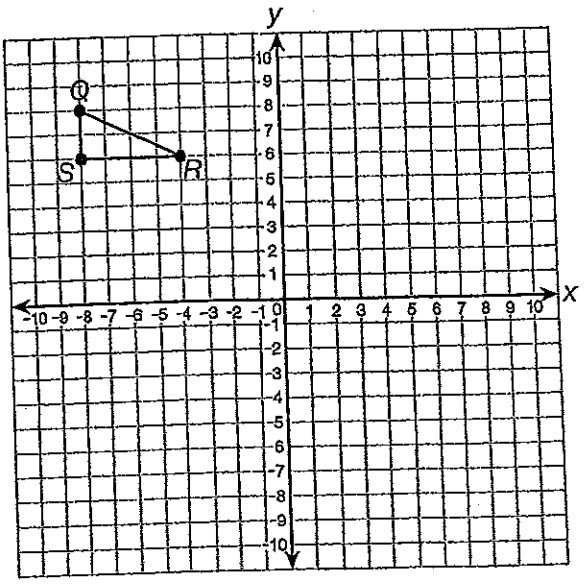
Practice

Directions: For questions 1 and 2, draw the given transformation of each figure.

1. 180° clockwise rotation of *JKLM* around the origin

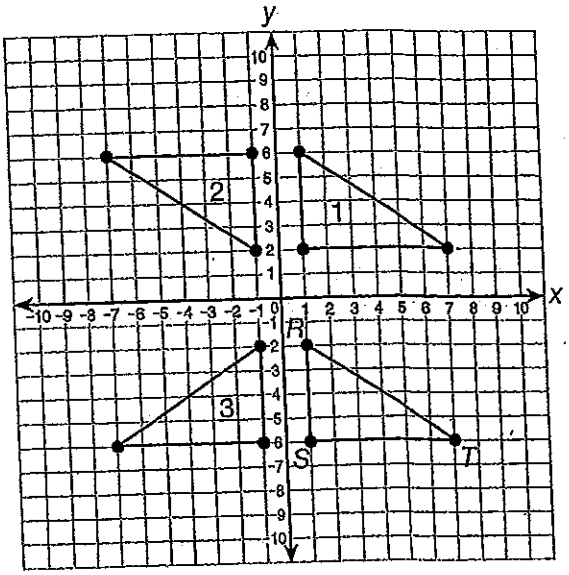


2. 90° counterclockwise rotation of *QRS* around the origin



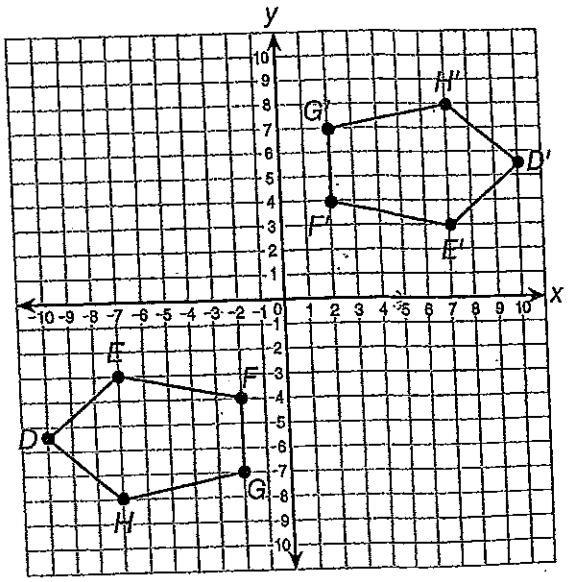
3. Which figure is a 180° rotation about the origin of *RST*?

_____



4. *D′E′F′G′H′* is a rotation of *DEFGH*. How are the figures the same?

_____



90° Counterclockwise Rotation

$W(-1,-1) \rightarrow W'(\quad,\quad)$

$X(\quad,\quad) \rightarrow X'(\quad,\quad)$

RULE for a 90° CCW

_____

90° Clockwise Rotation

$W(-1,-1) \rightarrow W'(\quad,\quad)$

$X(\quad,\quad) \rightarrow X'(\quad,\quad)$

Rule for 90° CW

_____

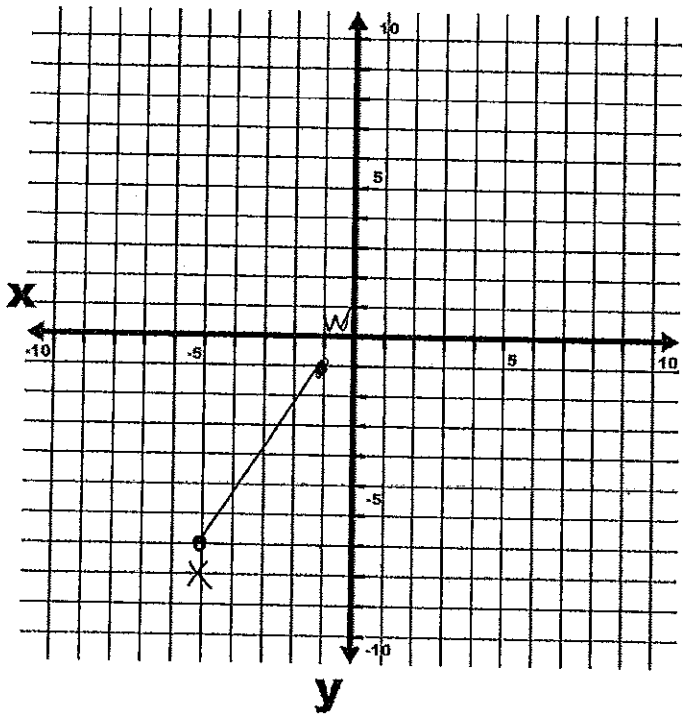
180° Rotation

$W(-1,-1) \rightarrow W'(\quad,\quad)$

$X(\quad,\quad) \rightarrow X'(\quad,\quad)$

Rule for 180° rotation

_____



90° Counterclockwise Rotation

$A(3, 8) \rightarrow A'(\quad,\quad)$

$B(\quad,\quad) \rightarrow B'(\quad,\quad)$

$C(\quad,\quad) \rightarrow C'(\quad,\quad)$

RULE for a 90° CCW

_____

90° Clockwise Rotation

$A(\quad,\quad) \rightarrow A'(\quad,\quad)$

$B(\quad,\quad) \rightarrow B'(\quad,\quad)$

$C(\quad,\quad) \rightarrow C'(\quad,\quad)$

Rule for 90° CW

_____

180° Rotation

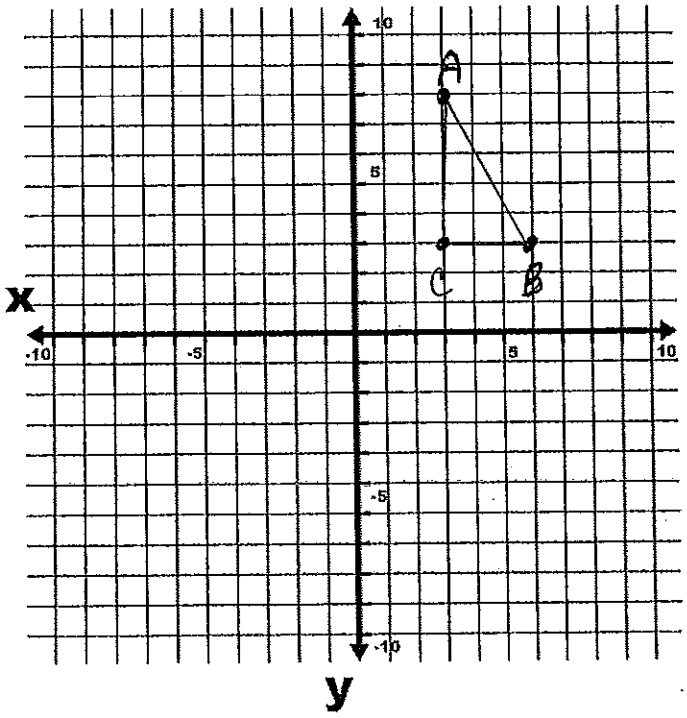
$A(\quad,\quad) \rightarrow A'(\quad,\quad)$

$B(\quad,\quad) \rightarrow B'(\quad,\quad)$

$C(\quad,\quad) \rightarrow C'(\quad,\quad)$

Rule for 180° rotation

_____



90° Counterclockwise Rotation

$M(-7, 4) \rightarrow M'(\quad , \quad)$

$A(\quad , \quad) \rightarrow A'(\quad , \quad)$

$T(\quad , \quad) \rightarrow T'(\quad , \quad)$

$H(\quad , \quad) \rightarrow H'(\quad , \quad)$

RULE for a 90° CCW

_____

90° Clockwise Rotation

$M(-7, 4) \rightarrow M'(\quad , \quad)$

$A(\quad , \quad) \rightarrow A'(\quad , \quad)$

$T(\quad , \quad) \rightarrow T'(\quad , \quad)$

$H(\quad , \quad) \rightarrow H'(\quad , \quad)$

Rule for 90° CW

_____

180° Rotation

$M(-7, 4) \rightarrow M'(\quad , \quad)$

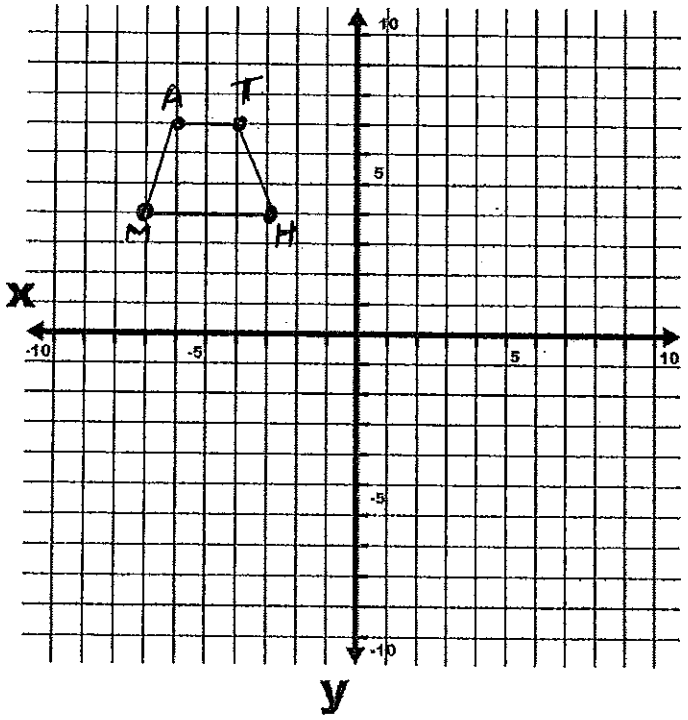
$A(\quad , \quad) \rightarrow A'(\quad , \quad)$

$T(\quad , \quad) \rightarrow T'(\quad , \quad)$

$H(\quad , \quad) \rightarrow H'(\quad , \quad)$

Rule for 180° rotation

_____



90° Counterclockwise Rotation

$A(3, -3) \rightarrow A'(\quad , \quad)$

$B(\quad , \quad) \rightarrow B'(\quad , \quad)$

$C(\quad , \quad) \rightarrow C'(\quad , \quad)$

$D(\quad , \quad) \rightarrow D'(\quad , \quad)$

RULE for a 90° CCW

_____

90° Clockwise Rotation

$A(3, -3) \rightarrow A'(\quad , \quad)$

$B(\quad , \quad) \rightarrow B'(\quad , \quad)$

$C(\quad , \quad) \rightarrow C'(\quad , \quad)$

$D(\quad , \quad) \rightarrow D'(\quad , \quad)$

Rule for 90° CW

_____

180° Rotation

$A(3, -3) \rightarrow A'(\quad , \quad)$

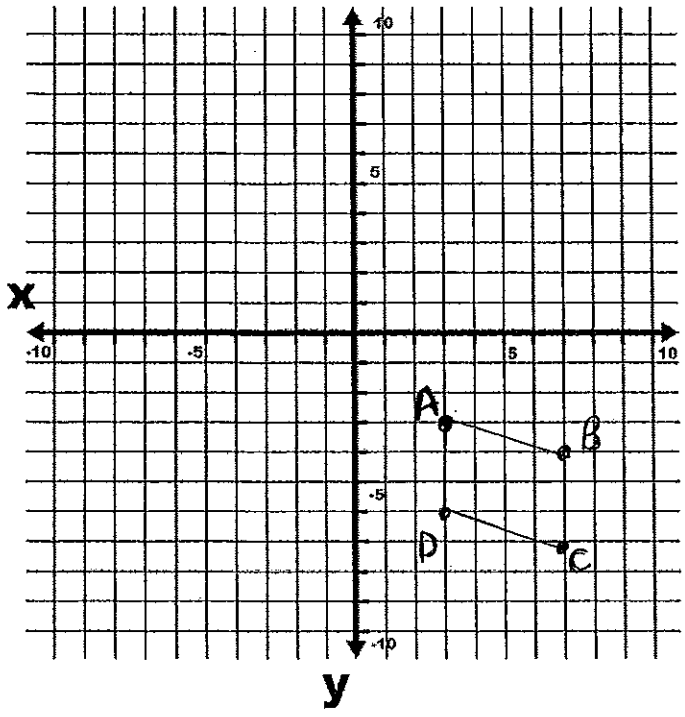
$B(\quad , \quad) \rightarrow B'(\quad , \quad)$

$C(\quad , \quad) \rightarrow C'(\quad , \quad)$

$D(\quad , \quad) \rightarrow D'(\quad , \quad)$

Rule for 180° rotation

_____



Rotations

Pre-image	Image 90Clockwise	Image 90 Counterclockwise	Image 180
X(-4,1)			
Y(-1,5)			
Z(-6,9)			
R(-2,-1)			
S(0,-4)			
T(-4,-7)			

Rule for 90 clockwise:_____

Rule for 90 counterclockwise:_____

Rule for 180:_____