

Rotations Notes

Rotation - turning a figure about a fixed point

How can we turn objects?

1.

2.

We need to know the two "D's" of rotations:

1.

2.

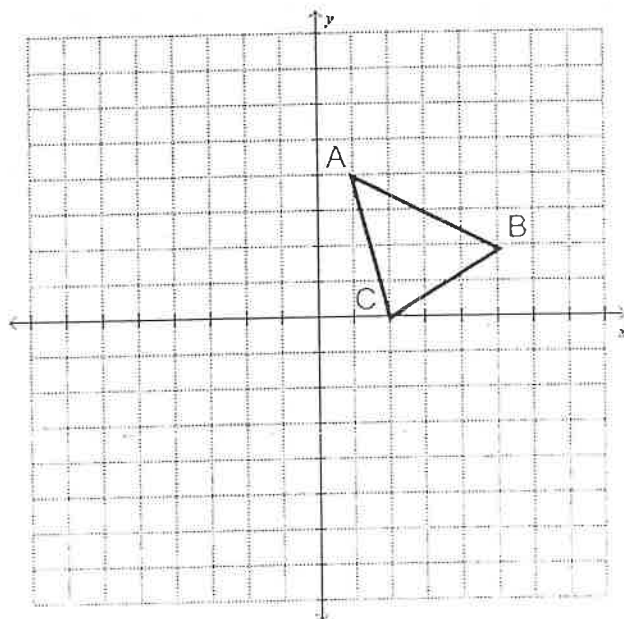
After a rotation has been performed, is the image going to be *similar* or *congruent*? Explain.

1. Triangle ABC is labeled on your graph below.

a) Rotate Triangle ABC , 90° counterclockwise. Label the triangle $A'B'C'$.

b) Rotate Triangle ABC , 180° counterclockwise. Label the triangle $A''B''C''$.

c) Rotate Triangle ABC , 270° counterclockwise. Label the triangle $A'''B'''C'''$.



2. Organize your results from Part A in the table.

Starting Point	90° Rotation CC	180° Rotation CC	270° Rotation CC	360° Rotation CC
A (1, 4)				
B (5, 2)				
C (2, 0)				

3. Complete each rule for finding the image of any point (x, y) under the given rotation.

a) 90° rotation about the origin: $(x, y) \rightarrow (\quad , \quad)$

b) 180° rotation about the origin: $(x, y) \rightarrow (\quad , \quad)$

c) 270° rotation about the origin: $(x, y) \rightarrow (\quad , \quad)$

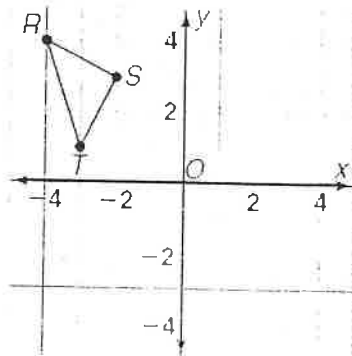
d) 360° rotation about the origin: $(x, y) \rightarrow (\quad , \quad)$

4. What are the coordinates of $(3, -2)$ under a 90° counterclockwise rotation about the origin?

5. What are the coordinates of $(-5, 4)$ under a 180° counterclockwise rotation about the origin?

6. What are the coordinates of $(3, 2)$ under a 90° **clockwise** rotation about the origin?

7. Draw the image created by rotating triangle RST 90° counterclockwise about the origin and label it $R'S'T'$ and then reflect that image in the x -axis, labeling it $R''S''T''$.



Rotations Notes

Rotation - turning a figure about a fixed point

usually about the origin

Key

* Complete this wksht prior to 9.3 Digits

How can we turn objects?

1. Clockwise - to the right
2. Counterclockwise - to the left

* Usually Counterclockwise

We need to know the two "D's" of rotations:

1. Degree - how far
2. Direction - which way

After a rotation has been performed, is the image going to be *similar* or *congruent*? Explain.

Same size & shape

1. Triangle ABC is labeled on your graph below.

a) Rotate Triangle ABC , 90° counterclockwise. Label the triangle $A'B'C'$.

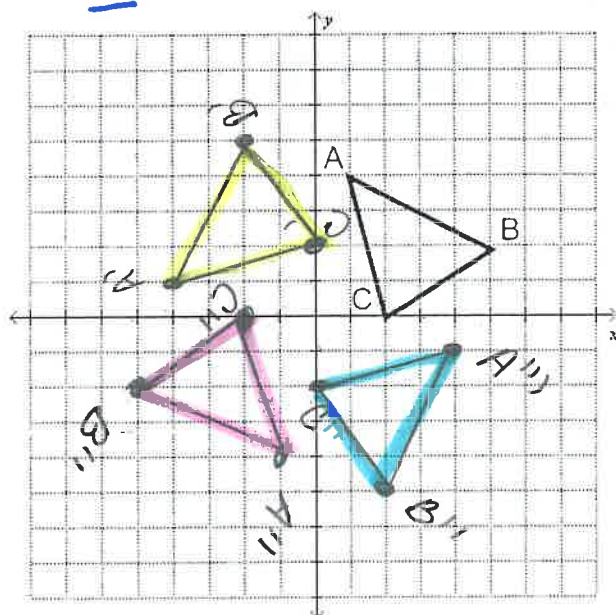
$$\begin{aligned} A(1,4) &\rightarrow A'(-4,1) \\ B(5,2) &\rightarrow B'(-2,5) \\ C(2,0) &\rightarrow C'(0,2) \\ (x,y) &\rightarrow (-y,x) \end{aligned}$$

b) Rotate Triangle ABC , 180° counterclockwise. Label the triangle $A''B''C''$.

$$\begin{aligned} A(1,4) &\rightarrow A''(-1,-4) \\ B(5,2) &\rightarrow B''(-5,-2) \\ C(2,0) &\rightarrow C''(-2,0) \\ (x,y) &\rightarrow (-x,-y) \end{aligned}$$

c) Rotate Triangle ABC , 270° counterclockwise. Label the triangle $A'''B'''C'''$.

$$\begin{aligned} A(1,4) &\rightarrow A'''(4,-1) \\ B(5,2) &\rightarrow B'''(2,-5) \\ C(2,0) &\rightarrow C'''(0,-2) \\ (x,y) &\rightarrow (y,-1x) \end{aligned}$$



2. Organize your results from Part A in the table.

90°
clockwise
or

SAME!

Starting Point	90° Rotation CC	180° Rotation CC	270° Rotation CC	360° Rotation CC
A (1, 4)	A' (-4, 1)	A'' (-1, -4)	A''' (4, -1)	A (1, 4)
B (5, 2)	B' (-2, 5)	B'' (-5, -2)	B''' (2, -5)	B (5, 2)
C (2, 0)	C' (0, 2)	C'' (-2, 0)	C''' (0, -2)	C (2, 0)

3. Complete each rule for finding the image of any point (x, y) under the given rotation.

a) 90° rotation about the origin: $(x, y) \rightarrow (-y, x)$

b) 180° rotation about the origin: $(x, y) \rightarrow (-x, -y)$

c) 270° rotation about the origin: $(x, y) \rightarrow (y, -x)$

d) 360° rotation about the origin: $(x, y) \rightarrow (x, y)$

4. What are the coordinates of (3, -2) under a 90° counterclockwise rotation about the origin?

Rule A) (2, 3)

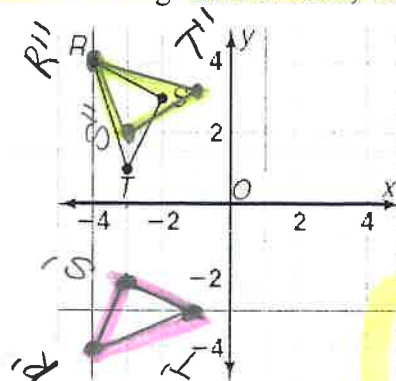
5. What are the coordinates of (-5, 4) under a 180° counterclockwise rotation about the origin?

Rule B) (5, -4)

6. What are the coordinates of (3, 2) under a 90° clockwise rotation about the origin?

Rule C) (2, -3)

7. Draw the image created by rotating triangle RST 90° counterclockwise about the origin and label it R'S'T' and then reflect that image in the x-axis, labeling it R''S''T''.



$$\begin{aligned} R(-4, 4) &\rightarrow R'(-4, -4) \\ S(-2, 3) &\rightarrow S'(-3, -2) \\ T(-3, 1) &\rightarrow T'(-1, -3) \end{aligned}$$

$$\begin{aligned} R'(-4, -4) &\rightarrow R''(-4, 4) \\ S'(-3, -2) &\rightarrow S''(-3, 2) \\ T'(-1, -3) &\rightarrow T''(-1, 3) \end{aligned}$$