



# Rotations: Lesson 7 Corresponding Sides

Name \_\_\_\_\_

## Student Activity



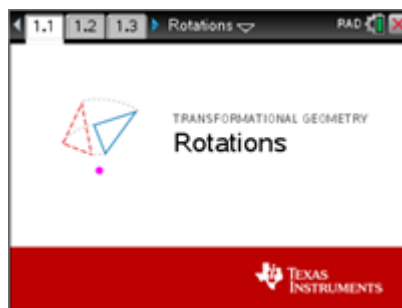
Class \_\_\_\_\_

In this lesson, you will investigate the corresponding sides (not their lengths) of rotated triangles and look for patterns.

Open the document: *Rotations.tns*.

**It is important that the Rotations Tour be done before any Rotations lessons.**

PLAY INVESTIGATE EXPLORE DISCOVER



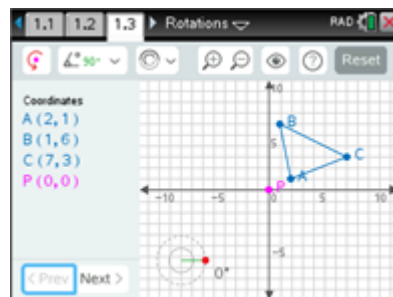
Move to page 1.3. ( ► two times)

On the handheld, press ► and ◀ to navigate through the pages of the lesson.  
(On the iPad®, select the page thumbnail in the page sorter panel.)

1. Press to open the menu.

(On the iPad, tap the wrench icon to open the menu.)

Press (1: Templates), (6: Slopes).



2. Click on or press to rotate  $\triangle ABC$   $90^\circ$  about the origin, point P.

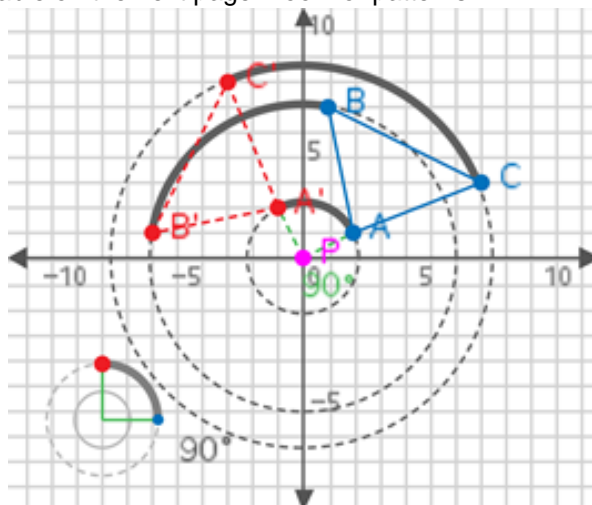
Each person in the group will pick a different pair of corresponding sides. Circle your choice.

i)  $\overline{AB}$  and  $\overline{A'B'}$     ii)  $\overline{BC}$  and  $\overline{B'C'}$     iii)  $\overline{CA}$  and  $\overline{C'A'}$

Calculate the slopes of corresponding sides by hand – either graphically or by slope formula.

Show your work in the space provided below. Write your answers as fractions in simplest form.

Record the slopes in the first row (Original) of the table on the next page. Look for patterns.





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- a. Collaborate and summarize the answers in the table below:

Rotate 90°	$m(\overline{AB})$	$m(\overline{A'B'})$	$m(\overline{BC})$	$m(\overline{B'C'})$	$m(\overline{CA})$	$m(\overline{C'A'})$
Original						
Figure i						
Figure ii						
Figure iii						
Figure iv						

- b. Check your answers. To see the slopes, click on Next > or press ].  
The slopes are listed as decimals on the screen. Rewrite them as fractions in simplest form and compare these fractions to the answers in the 'Original' row above.  
Make corrections as needed.
- c. Look at the slopes of corresponding sides. Discuss in your groups what pattern you notice about these numbers.
- d. Continue to investigate for several more triangles and look for patterns.  
Each person in the group will pick a different Figure i, ii, iii, or iv (from the following)

To see the coordinates of the vertices on the screen, click on < Prev or press [.

- i) Grab and move the vertices so that A: (1, 2) B: (4, 8) C: (9, 4)
- ii) Grab and move the vertices so that A: (1, 3) B: (3, 7) C: (4, 3)
- iii) Grab and move the vertices so that A: (4, 3) B: (0, 7) C: (8, 5)
- iv) Grab and move the vertices so that A: (2, 1) B: (2, 5) C: (10, 1)

To see the slopes, click on Next > or press ].

Write the slopes of  $\overline{AB}$ ,  $\overline{A'B'}$ ,  $\overline{BC}$ ,  $\overline{B'C'}$ ,  $\overline{CA}$ ,  $\overline{C'A'}$  as fractions in simplest form.

Show your work on this paper.

When all the students in your group are finished, record all the slopes as fractions in the appropriate places (Figure i, ii, iii, or iv) in the previous table.



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
Name \_\_\_\_\_

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Class \_\_\_\_\_

- e. Look at the slopes of each pair of corresponding sides  $\overline{AB}$  and  $\overline{A'B'}$  listed in the table.  
What is true about the slopes of these two segments?
- f. Look at the slopes of each pair of corresponding sides  $\overline{BC}$  and  $\overline{B'C'}$  listed in the table.  
What is true about the slopes of these two segments?
- g. Look at the slopes of each pair of corresponding sides  $\overline{CA}$  and  $\overline{C'A'}$  listed in the table.  
What is true about the slopes of these two segments?
- h. If segments (lines) are to be parallel, what must be true about their slopes?
- i. If segments (lines) are to be perpendicular, what must be true about their slopes?
- j. Based upon your observations, complete the following:  
If a triangle is rotated about the origin  $90^\circ$ , the slopes of corresponding sides  
are \_\_\_\_\_. The lines that contain  
these corresponding sides will be \_\_\_\_\_ to each other.

3. Reset the page. Press  (   ).

- a. Rotate  $\triangle ABC$   $180^\circ$  about the origin by clicking on  twice or by pressing on (  ) twice.  
To see the slopes, click on  or press .

Record the slopes as decimals in the first row (Original) of the table below. Look for patterns.

Rotate $180^\circ$	$m(\overline{AB})$	$m(\overline{A'B'})$	$m(\overline{BC})$	$m(\overline{B'C'})$	$m(\overline{CA})$	$m(\overline{C'A'})$
Original						
Figure 1						
Figure 2						



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b. Continue to investigate.

Grab and move each of the three vertices of  $\triangle ABC$  (**A**, **B**, **C**).

Record the slopes observed in row "Figure 1" in the previous table.

c. Grab and move each of the three vertices of  $\triangle ABC$  (**A**, **B**, **C**).

Record the slopes observed in row "Figure 2" in the previous table.


d. Based upon your observations, complete the following:

If a triangle is rotated about the origin  $180^\circ$ , the slopes of corresponding sides

are \_\_\_\_\_. The lines that contain

these corresponding sides will be \_\_\_\_\_ to each other.

4. Reset the page. Press **Reset** ( **ctrl** **del** ).

a. Rotate  $\triangle ABC$   $270^\circ$  about the origin by clicking on  three times or by pressing on (**Q**) three times.

To see the slopes, click on **Next >** or press **J**. Record the slopes as fractions in simplest form in the first row (Original) of the table below. Look for patterns.

Rotate $270^\circ$	$m(\overline{AB})$	$m(\overline{A'B'})$	$m(\overline{BC})$	$m(\overline{B'C'})$	$m(\overline{CA})$	$m(\overline{C'A'})$
Original						
Figure 1						

b. Click on **< Prev** or press **I**. Grab and move the vertices to the following points:

A: (4, 3)    B: (0, 7)    C: (8, 5) To view the slopes, click on **Next >** or press **J**.

Record the slopes as fractions in simplest form in row "Figure 1" in the previous table.

c. Based upon your observations, complete the following:

If a triangle is rotated about the origin  $270^\circ$ , the slopes of corresponding sides

are \_\_\_\_\_. The lines that contain

these corresponding sides will be \_\_\_\_\_ to each other.