

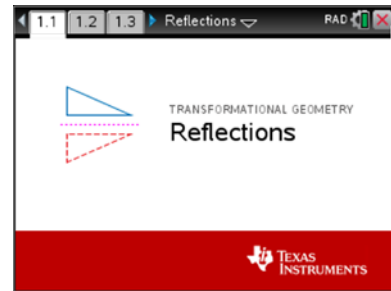


In this lesson, you will investigate the slopes of sides of triangles that have been reflected about different lines and look for patterns.

Open the document: *Reflections.tns*.

It is important the Reflections Tour be done before any Reflections lessons.


PLAY INVESTIGATE EXPLORE DISCOVER



Move to page 1.4. (**ctrl** ▶ three times)

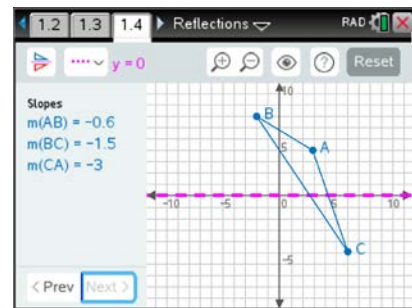
On the handheld, press **ctrl** ▶ and **ctrl** ◀ to navigate through the pages of the lesson. (On the iPad®, select the page thumbnail in the page sorter panel.)


1. Press **menu** to open the menu.

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

Press **1** (1: Templates), **7** (7: Slopes).

Click on **Next >** or press **]** to see the slopes of the sides of the triangle.



2. Reflect $\triangle ABC$ about the line $y = 0$. (click on  or press **R**).

- Record the Original slopes (first measures displayed) in the first row of the table below. Look for patterns.

Line $y = 0$	$m \overline{AB}$	$m \overline{BC}$	$m \overline{CA}$	$m \overline{A'B'}$	$m \overline{B'C'}$	$m \overline{C'A'}$
Original						
Figure 1						

- Investigate and mentally make note of the slopes by grabbing and moving each of the three vertices of $\triangle ABC$ (**A**), (**B**), (**C**) and the entire shape (**S**) to create different shaped triangles. Record a set of data observed in row "Figure 1" in the previous table. Discuss what is similar and what is different about slopes of corresponding sides.


- Discuss within your group what happens to the slopes of sides of a triangle that is reflected about the line $y = 0$. Write a generalization using words below.



3. Change the line of reflection to the **vertical line, $x = 0$** (press **[I]**).
- a. Record the Original slopes in the table below. Look for patterns.

Vertical line $x = 0$	$m_{\overline{AB}}$	$m_{\overline{BC}}$	$m_{\overline{CA}}$	$m_{\overline{A'B'}}$	$m_{\overline{B'C'}}$	$m_{\overline{C'A'}}$
Original						
Figure 1						

- b. Investigate and mentally make note of the slopes by grabbing and moving each of the three vertices of $\triangle ABC$ (**[A]**, **[B]**, **[C]**) and the entire shape (**[S]**) to create different shaped triangles. Record a set of data observed in row "Figure 1" in the previous table. Discuss what is similar and what is different about slopes of corresponding sides.
- c. Discuss within your group what happens to the slopes of sides of a triangle that is reflected about the line $x = 0$. Write a generalization using words below.

4. Reset the page (**Reset** or **[ctrl]** followed by **[del]**).
- Change the line of reflection to the **slanted line, $y = x$** . (press **[J]**).
- Grab and move the vertices so that the coordinates are A: $(-3, 7)$, B: $(-6, 1)$, C: $(-2, 2)$.
- Reflect $\triangle ABC$ about the line $y = x$. (click on  or press **[R]**).

Click on **Next >** or press **[J]** to see the slopes of the sides of the triangle.

- a. Record the slopes **as fractions** in simplest form in the table below in the Original row. Look for patterns and discuss in your groups.

Slanted line $y = x$	$m_{\overline{AB}}$	$m_{\overline{BC}}$	$m_{\overline{CA}}$	$m_{\overline{A'B'}}$	$m_{\overline{B'C'}}$	$m_{\overline{C'A'}}$
Original						
Figure 1						
Figure 2						

Before continuing, discuss what is similar and what is different about slopes of corresponding sides.



Reflections: Lesson 7 Slopes

Name _____

Student Activity

Class _____

- b. Click on or press to view the coordinates.
 Grab and move the vertices so that the coordinates are A: (- 3, 3), B: (1, 5), C: (- 4, 7).
 Click on or press to see the slopes of the sides of the triangle.
 Record the slopes **as fractions** in simplest form in the previous table in the "Figure 1" row.
 Look for patterns and discuss in your groups.

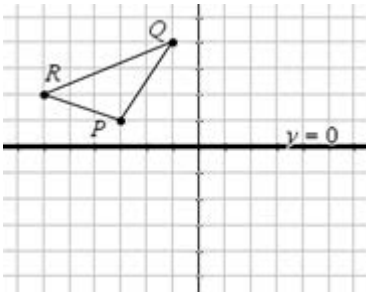
- c. Click on or press to view the coordinates.
 Grab and move the vertices so that the coordinates are A: (- 3, 7), B: (2, 7), C: (1, 2).
 Click on or press to see the slopes of the sides of the triangle.
 Record the slopes **as fractions** in simplest form in the previous table in the "Figure 2" row.
 Look for patterns and discuss in your groups.

- d. Write a generalization using words about the slopes of triangles reflected about $y = x$.

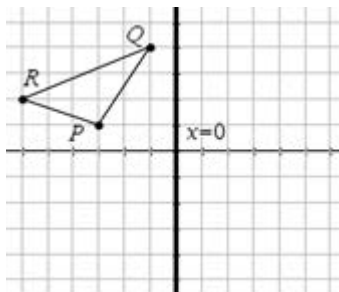
- e. Summarize your findings. Reflect $\triangle PQR$ about each of the lines below.

Use these diagrams to answer the questions. Write your answers **as fractions** in simplest form.

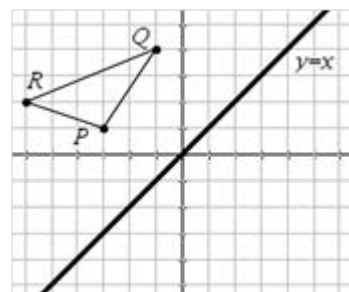
i)



ii)



iii)



- f. $\triangle PQR$ is reflected about the line $y = 0$. What are the slopes of each of the sides as fractions?

$m\overline{PQ}$	$m\overline{P'Q'}$	$m\overline{QR}$	$m\overline{Q'R'}$	$m\overline{PR}$	$m\overline{P'R'}$

- g. $\triangle PQR$ is reflected about the line $x = 0$. What are the slopes of each of the sides as fractions?

$m\overline{PQ}$	$m\overline{P'Q'}$	$m\overline{QR}$	$m\overline{Q'R'}$	$m\overline{PR}$	$m\overline{P'R'}$



h. $\triangle PQR$ is reflected about the line $y = x$. What are the slopes of each of the sides as fractions?

$m\overline{PQ}$	$m\overline{P'Q'}$	$m\overline{QR}$	$m\overline{Q'R'}$	$m\overline{PR}$	$m\overline{P'R'}$

Verify your generalizations algebraically.

i. Given: $\triangle ABC$ is reflected about the x-axis. The coordinates are:

$A:(x_1, y_1)$ $B:(x_2, y_2)$ $C:(x_3, y_3)$ State the coordinates of the images of the vertices

below:

A' : _____ B' : _____ C' : _____

Use the coordinates to find the slopes of corresponding sides and validate your generalization.

j. Given: $\triangle ABC$ is reflected about the y-axis. The coordinates are:

$A:(x_1, y_1)$ $B:(x_2, y_2)$ $C:(x_3, y_3)$ State the coordinates of the images of the vertices

below:

A' : _____ B' : _____ C' : _____

Use the coordinates to find the slopes of corresponding sides and validate your generalization.

k. Given: $\triangle ABC$ is reflected about the line $y = x$. The coordinates are:

$A:(x_1, y_1)$ $B:(x_2, y_2)$ $C:(x_3, y_3)$ State the coordinates of the images of the vertices

below:

A' : _____ B' : _____ C' : _____

Use the coordinates to find the slopes of corresponding sides and validate your generalization.