

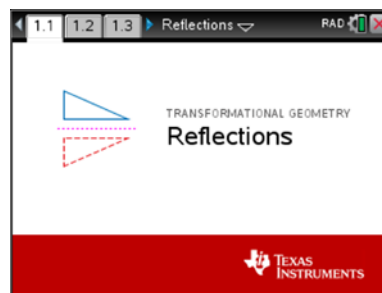


In this lesson, you will investigate the perimeters and areas of triangles that have been reflected about different lines.

Open the document: *Reflections.tns*.

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


PLAY INVESTIGATE EXPLORE DISCOVER



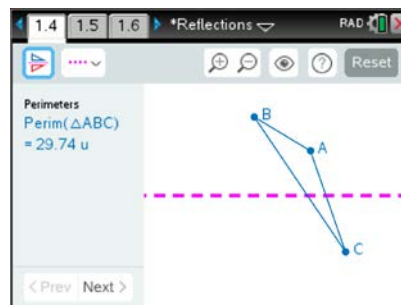
Move to page 1.4. ( **ctrl** ▶ three times)



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 on the wrench icon  to open the menu.)

Press **1** (1: Templates), **4** (4: Perimeters & Areas).



2. Reflect  $\triangle ABC$  about the **horizontal line**. (click on  or press **R**). Zoom  in (**+**) or out (**-**) as needed.

a. Record the Original perimeters (first measures displayed) in the appropriate places of the **Horizontal Line** section in the table below.

b. Investigate and mentally make note of the perimeters 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 following table.

Horizontal Line	Perimeter $\triangle ABC$	Perimeter $\triangle A'B'C'$	Vertical Line	Perimeter $\triangle ABC$	Perimeter $\triangle A'B'C'$
Original			Original		
Figure 1			Figure 1		

To change the line of reflection, use the appropriate shortcut key:

**H** Horizontal line

**I** Vertical line

**J** Slanted line

(On the iPad®, tap the Reflection Line dropdown menu icon and select the line of reflection.)



- c. Change the line of reflection to a **vertical line** (press the letter **I** ).  
Record the Original perimeters in the appropriate places of the **Vertical Line** section in the previous table.
- d. Investigate and mentally make note of the perimeters 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.
- e. Change the line of reflection to a **slanted line** (press the letter **J** ).  
Record the Original perimeters in the appropriate places of the **Slanted Line** section in the following table.






<b>Slanted Line</b>	Perimeter $\triangle ABC$	Perimeter $\triangle A'B'C'$
Original		
Figure 1		

- f. Investigate and mentally make note of the perimeters 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.
  - g. Many different triangles were reflected about several different lines.  
Make a conjecture about the perimeters of reflected triangles.  
A **conjecture** is an opinion or conclusion based upon what is observed.
  - h. Based on explorations of reflected triangles in previous lessons, explain why this conjecture is true.
3. Do a similar exploration about the areas of reflected triangles about different lines.  
To change the line of reflection, use the appropriate shortcut key:

**H** Horizontal line      **I** Vertical line      **J** Slanted line

(On the iPad<sup>®</sup>, tap the Reflection Line dropdown menu icon and select the line of reflection.)













- a. Reset the page. Press  (   ).  
Click on  or press  to explore the areas of the triangles.





Reflect  $\triangle ABC$  about the **horizontal line**. (click on  or press ).

Record the Original areas (first measures displayed) in the appropriate places of the **Horizontal Line** section in the table below.

Horizontal Line	Area $\triangle ABC$	Area $\triangle A'B'C'$	Vertical Line	Area $\triangle ABC$	Area $\triangle A'B'C'$
Original			Original		
Figure 1			Figure 1		

- b. Investigate and mentally make note of the areas by grabbing and moving each of the three vertices of  $\triangle ABC$  (, ,  ) and the entire shape (  ) to create different shaped triangles. Record a set of data observed in row "Figure 1" in the previous table.
- c. Change the line of reflection to a **vertical line** (press the letter  ).  
Record the Original areas in the appropriate places of the **Vertical Line** section in the previous table.
- d. Investigate and mentally make note of the areas by grabbing and moving each of the three vertices of  $\triangle ABC$  (, ,  ) and the entire shape (  ) to create different shaped triangles. Record a set of data observed in row "Figure 1" in the previous table.
- e. Change the line of reflection to a **slanted line** (press the letter  ).  
Record the Original areas in the appropriate places of the **Slanted Line** section in the following table.

Slanted Line	Area $\triangle ABC$	Area $\triangle A'B'C'$
Original		
Figure 1		

- f. Investigate and mentally make note of the areas by grabbing and moving each of the three vertices of  $\triangle ABC$  (, ,  ) and the entire shape (  ) to create different shaped triangles. Record a set of data observed in row "Figure 1" in the previous table.



- g. Many different triangles have been reflected about several different lines.  
Make a conjecture about the areas of reflected triangles.  
A conjecture is an opinion or conclusion based upon what is observed.

- h. Based on explorations of reflected triangles in previous lessons, explain why this conjecture is true.

4.  $\triangle JKL$  is reflected about line  $k$ . The perimeter of  $\triangle JKL$  is 40 cm and its area is 60 sq cm.

a. What is the perimeter of  $\triangle J'K'L'$ ? \_\_\_\_\_

b. What is the area of  $\triangle J'K'L'$ ? \_\_\_\_\_