Translations: Lesson 6 Corresponding Sides

Name _____

Student Activity

Class _____

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

Open the document: *Translations.tns.*

It is important that one of the Translations Tours be done before any Translations lessons.

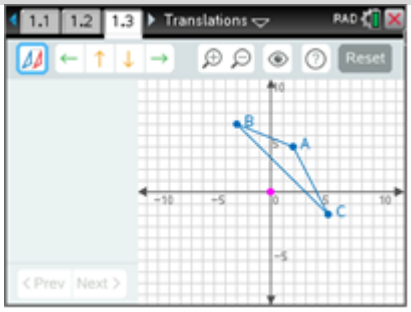
PLAY INVESTIGATE EXPLORE DISCOVER

Move to page 1.3. (ctrl ▶ two 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), 4 (4: Grid).



2. Translate ΔABC **to the right 5 units** by pressing the right arrow (▶) 5 times.

   Then click on or press T. Zoom in (+) or out (−) as needed.

   a. Look at corresponding sides, $\overline{AB}$ *and* $\overline{A'B'}$. We have already established that these two segments are congruent (have the same length).
   What else appears to be true about these two segments?

   b. Look at corresponding sides, $\overline{BC}$ *and* $\overline{B'C'}$. We have already established that these two segments are congruent (have the same length).
   What else appears to be true about these two segments?

   c. Look at corresponding sides, $\overline{CA}$ *and* $\overline{C'A'}$. We have already established that these two segments are congruent (have the same length).
   What else appears to be true about these two segments?

d. If segments (lines) are to be parallel, what must be true about their slopes?

e. Calculate the slope of each pair of corresponding sides. Record your answers as fractions:

Slope of $\overline{AB}$ = _____. Slope of $\overline{A'B'}$ = _____.

Slope of $\overline{BC}$ = _____. Slope of $\overline{B'C'}$ = _____.

Slope of $\overline{CA}$ = _____. Slope of $\overline{C'A'}$ = _____.

f. Based upon the results in part e above, is each pair of corresponding sides parallel?

g. This is not enough evidence to prove this conjecture for all triangles. Let's investigate more examples.

3. Press menu to open the menu.

(On the iPad, tap the wrench icon  to open the menu.)
Press 1 (1: Templates), 6 (6: Slopes Sides).
Translate ΔABC **up 3 units** by pressing the up arrow (▲) 3 times and to the **left 6 units** by pressing the left arrow (◀) 6 times.
Then click on  or press T. Zoom  in (+) or out (−) as needed.

a. Record the Original slopes (first slopes displayed) in the first row of the following table. Look for patterns.

Translate Up 3,Left 6	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						

b. Investigate and mentally make note of the slopes by grabbing and moving each of the three vertices of ΔABC (A, B, C) to create different shaped triangles.
Record a set of data observed in row "Figure 1" in the previous table.
Repeat and move each of the three vertices and record a set of data in row "Figure 2" in the previous table.
Look for patterns among the slopes of corresponding sides.

c. Using the pattern observed in the previous table, state a conjecture.

4. Reset the page. Press Reset (ctrl del).
Repeat what was done in exercise 3, but with each person in the group doing a different translation. Each person in the group should choose one from the following:
i) Translate ΔABC down 4 units and to the right 2 units.
ii) Translate ΔABC up 5 units.
iii) Translate ΔABC down 1 unit and to the left 4 units.
iv) Translate ΔABC up 6 units and to the left 3 units.

Then click on  or press T). Zoom  in (+) or out (−) as needed.

a. Record the Original slopes (first slopes displayed) in the first row of the following table.
Look for patterns.

Translate **i ii iii iv**	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						

b. Investigate and mentally make note of the slopes by grabbing and moving each of the three vertices of ΔABC (A, B, C) to create different shaped triangles.
Record a set of data observed in row "Figure 1" in the previous table.
Repeat and move each of the three vertices and record a set of data in row "Figure 2" in the previous table.
Look for patterns among the slopes of corresponding sides.

c. Using the pattern observed in the previous table, is your conjecture still true?

5. Many different triangles have been translated in several directions.
Generalize explorations and investigations by responding to the following:
If a triangle is translated, what appears to be true about the corresponding sides of the pre-image and image triangles?

6. ΔDEF has been translated down 7 units and to the right 8 units. Answer the following.

a. State three pairs of segments that are parallel: _____ _____ _____

b. If $\overline{DE}$ has a slope of $-\frac{4}{7}$, what other segment has a slope of $-\frac{4}{7}$? _____

c. If $\overline{EF}$ is horizontal, what other segment will be horizontal? _____

What is its slope? _____

d. If $\overline{F'D'}$ has a slope that is undefined, what other segment will have a slope that is undefined?

_____

What word can be used to describe $\overline{F'D'}$? _____