

Side-Splitter Theorem

ID: 12319

Time Required
15 minutes



Activity Overview

In this activity, students will explore the side-splitter theorem.

Topic: Ratio, Proportion & Similarity

- *Side-Splitter Theorem*

Teacher Preparation and Notes

- *To complete this activity, students will need to know how to change between pages, grab and move points.*
- *The multiple-choice items are self-check and students can check them by pressing  + .*
- ***To download the student TI-Nspire document (.tns file) and student worksheet, go to education.ti.com/exchange and enter “12319” in the quick search box.***

Associated Materials

- *SideSplitter_Student.doc*
- *SideSplitter.tns*

Suggested Related Activities

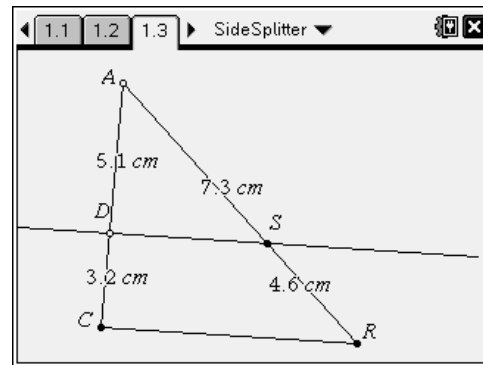
To download any activity listed, go to education.ti.com/exchange and enter the number in the quick search box.

- *Cabri Jr. – Side-Splitter Theorem (TI-84 Plus) — 7284*
- *Sail Problem (Parallel Lines & Segment Relationships) (TI-84 Plus) — 7683*

Problem 1 – Side-Splitter Theorem

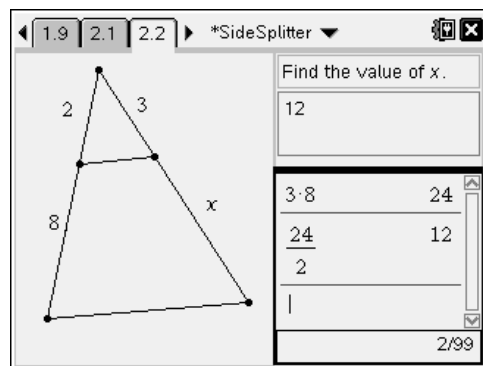
Students will begin this activity by looking at the side-splitter theorem. Students are given a triangle with a segment parallel to one side. They will discover that if a line is parallel to one side of a triangle and intersects the other two sides, then it divides those sides proportionally.

Students will be asked to collect data by moving point *A* and point *D*. Students are asked several questions about the relationships in the triangle.



Problem 2 – Application of the Side-Splitter Theorem

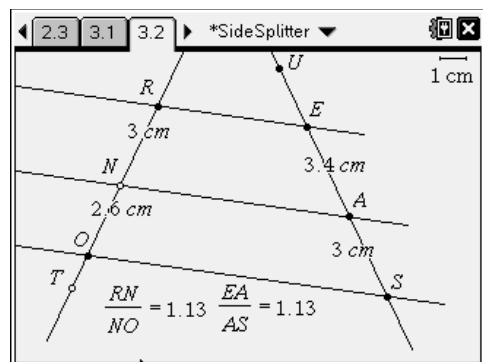
In Problem 2, students will be asked to apply the side-splitter theorem to several homework problems.



Problem 3 – Extension of the Side-Splitter Theorem

In Problem 3, students will discover the corollary to the Side-Splitter Theorem: If a line is parallel to one side of a triangle and intersects the other two sides, then it divides those sides proportionally.

Students are asked several questions about the corollary to the side-splitter theorem.



Student Solutions

1. Sample answers:

Position	AD	DC	AS	SR	$\frac{AD}{DC}$	$\frac{AS}{SR}$
1	5.1	3.2	7.3	4.6	1.59	1.59
2	4.5	2.9	7.8	4.9	1.59	1.59
3	5.3	2.1	9	3.7	2.47	2.475
4	2.8	4.6	4.8	7.9	0.61	0.61

2. The ratios of the side lengths are equal.

3. $\frac{AD}{DC} = \frac{AS}{SR}$

4. The ratio remains the same.

5. The ratio changes when moving point *D*.

6. When you move the parallel line, you are changing the proportion between the upper and lower segments. When you move the point, the segments may get longer or shorter, but the proportion stays the same.

7. 12

8. 16.8

9. Sample answers:

Position	RN	NO	EA	AS	$\frac{RN}{NO}$	$\frac{EA}{AS}$
1	3	2.6	3.4	3	1.13	1.13
2	3	2.6	2.7	2.4	1.13	1.13
3	2	3.7	1.8	3.3	0.54	0.54
4	1.5	4.1	1.4	3.7	0.37	0.37

10. The ratios are equal.

11. $\frac{RN}{NO}$ and $\frac{EA}{AS}$ are congruent