Area of a Parallelogram

Teachers Teaching with Technology™
Professional Development from Texas Instruments

Teacher Notes & Answers

7 8 9 10 11 12

TI-Nspire™ | Investigation | Student | 25 min

Introduction

In this activity you will explore ways to determine the area of a parallelogram.

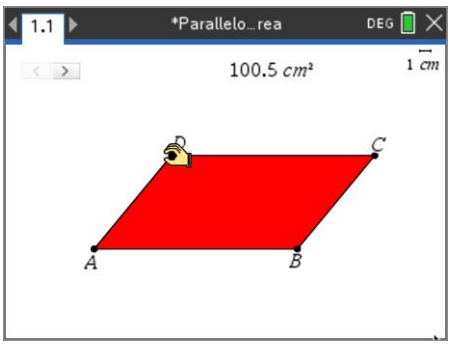
Teacher Notes:

This activity is best done before the area of a triangle activity.

Exploring

Open the TI-Nspire document: Parallelogram Area

Use the trackpad to grab and move vertex A.



Question: 1

Does moving vertex A change the area of the parallelogram?

Answer: No – The 'shape' change but the area does not.

Teacher Notes: Neither the base or height change whilst moving vertex A.

Question: 2

Grab vertex B. Does changing vertex B change the area of the parallelogram?

Answer: Yes. Vertex B changes the size of the base and the area.

Question: 3

Grab vertex D. Does changing vertex D change the area of the parallelogram?

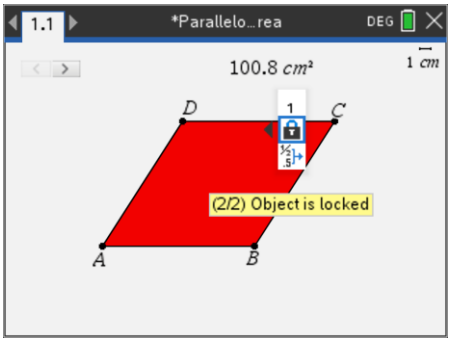
Answer: Yes. Vertex D changes both the height and base of the parallelogram … and therefore area.

Adjust the appropriate vertices so that the area of the parallelogram is approximately 100cm^2.

Place the mouse over the top of the area measurement and press:

ctrl + menu to access the contextual menu.

Select **Attributes** from the drop-down menu, then arrow down to the padlock and across to lock it! The area of the parallelogram is now locked and will not change.



Question: 4

With the padlock 'locked', drag vertex D. Can the parallelogram still change shape?

Answer: Yes. D moves parallel to the base: AB.

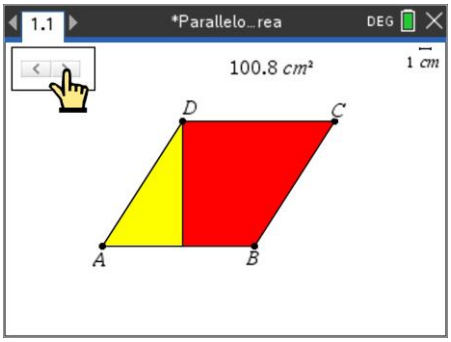
Author: P. Fox

Navigate to the slider (top right of screen) and click on the right-hand side of the slider.

With each click on the slider a slight change will happen to the diagram. For the first click a triangle appears!

Keep clicking on the slider until some measurements appear.

Note: You can go backwards by clicking the left side of the slider.



Question: 5

Complete the following statement: "The area of the parallelogram is equal to: …."

Answer: "the area of a rectangle with the same height and base". (length by width)

Question: 6

Unlock the area of the parallelogram. Drag point D around with the slider on the last animation stage. Record four different parallelogram dimensions and the corresponding area.

Answer: Answers will vary. Students should see that the product: height x base = Area

Question: 7

Describe how the area of a parallelogram can be calculated.

Answer: The area of a parallelogram is given by: height x base = Area

Question: 8

If the parallelogram is cut in half along the diagonal: AC or BD, what shape will result?

Answer: The shape will be a triangle.

Teacher Notes: The purpose of this question is to provide a clue that cutting a parallelogram in 'half' produces two identical triangles (not proven, observation only). Therefore, the area of a triangle is half the area of a parallelogram. Given the area of a parallelogram is equal to base x height, then it follows the area of a triangle is ½ x base x height.

Author: P. Fox