## Unit 1 Lesson 5: Bases and Heights of Parallelograms

### 1 A Parallelogram and Its Rectangles (Warm up)

#### Student Task Statement

Elena and Tyler were finding the area of this parallelogram:



Here is how Elena did it:



Here is how Tyler did it:



How are the two strategies for finding the area of a parallelogram the same? How they are different?

#### Activity Synthesis



### 2 The Right Height?

#### Student Task Statement

Study the examples and non-examples of **bases** and **heights** of parallelograms.

* Examples: The dashed segments in these drawings represent the corresponding height for the given base.



* Non-examples: The dashed segments in these drawings do *not* represent the corresponding height for the given base.



1. Select **all** the statements that are true about bases and heights in a parallelogram.
	1. Only a horizontal side of a parallelogram can be a base.
	2. Any side of a parallelogram can be a base.
	3. A height can be drawn at any angle to the side chosen as the base.
	4. A base and its corresponding height must be perpendicular to each other.
	5. A height can only be drawn inside a parallelogram.
	6. A height can be drawn outside of the parallelogram, as long as it is drawn at a 90-degree angle to the base.
	7. A base cannot be extended to meet a height.
2. Five students labeled a base $b$ and a corresponding height $h$ for each of these parallelograms. Are all drawings correctly labeled? Explain how you know.
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### 3 Finding the Formula for Area of Parallelograms

#### Student Task Statement

For each parallelogram:

* Identify a base and a corresponding height, and record their lengths in the table.
* Find the area of the parallelogram and record it in the last column of the table.



|  |  |  |  |
| --- | --- | --- | --- |
| **parallelogram** | **base (units)** | **height (units)** | **area (sq units)** |
| **A** |  |  |  |
| **B** |  |  |  |
| **C** |  |  |  |
| **D** |  |  |  |
| **any parallelogram** | $b$ | $h$ |  |

In the last row, write an expression for the area of any parallelogram, using $b$ and $h$ .



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