## Lesson 1: Accessing Areas and Pondering Perimeters

* Let’s think about rectangles.

### 1.1: Which One Doesn’t Belong: Quadrilaterals

Which one doesn’t belong?

A



B



C



D



### 1.2: Inspect Some Rectangles

Here are some rectangles.



1. Which rectangle has the greatest perimeter?
2. Which rectangle has the greatest area?
3. Find a rectangle with the same perimeter, but an even greater area than the previous answer.
4. For the remaining questions, tables are provided to organize your work. Rectangle D has a perimeter of 32 units.
	1. Find the side lengths of three different possible rectangles that have this perimeter.
	2. Find a pair of side lengths for rectangle D that give the greatest area in square units.
	3. Find a pair of side lengths for rectangle D that give the smallest area in square units.

|  |  |  |  |
| --- | --- | --- | --- |
| * + length (units)
 | * + width (units)
 | * + perimeter (units)
 | * + area (square units)
 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. Rectangle E has an area of 36 square units.
	1. Find 3 pairs of side lengths that give this area.
	2. Find a pair of side lengths for rectangle E that give the greatest perimeter in whole-number units.
	3. Find a pair of side lengths for rectangle E that give the smallest perimeter in whole-number units.

|  |  |  |  |
| --- | --- | --- | --- |
| * + length (units)
 | * + width (units)
 | * + perimeter (units)
 | * + area (square units)
 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

### 1.3: Inspect Some Tables

Here are two tables. The first shows some measurements for Rectangle A, with a side length of 5 cm. The second shows some measurements of Rectangle B, which is a square.

1. Complete the table for Rectangle A and be prepared to explain your reasoning.

|  |  |  |  |
| --- | --- | --- | --- |
| * length (cm)
 | * width (cm)
 | * perimeter (cm)
 | * area (sq cm)
 |
| * 5
 | * 1
 | *
 | *
 |
| * 5
 | * 2
 | *
 | *
 |
| * 5
 | * 4
 | *
 | *
 |
| * 5
 | *
 | * 20
 | *
 |
| * 5
 | *
 | *
 | * 40
 |
| * 5
 | *
 | * 28
 | *
 |
| * 5
 | *
 | *
 | * 50
 |
| * 5
 | * $x$
 | *
 | *
 |

1. Complete the table for Rectangle B and be prepared to explain your reasoning.

|  |  |  |  |
| --- | --- | --- | --- |
| * length (cm)
 | * width (cm)
 | * perimeter (cm)
 | * area (sq cm)
 |
| * 1
 | * 1
 | *
 | *
 |
| * 2
 | * 2
 | *
 | *
 |
| * 3
 | * 3
 | *
 | *
 |
| * 4
 | *
 | * 16
 | *
 |
| *
 | * 8
 | *
 | *
 |
| *
 | *
 | *
 | * 100
 |
| *
 | * $x$
 | *
 | *
 |

1. Sketch the graph of each pair of quantities, where the width is plotted along the $x$-axis.
	1. $x$ and the perimeter of Rectangle A
	2. $x$ and the area of Rectangle A
	3. $x$ and the perimeter of Rectangle B
	4. $x$ and the area of Rectangle B











© CC BY 2019 by Illustrative Mathematics®