

Unit 3

Lesson 12 Summary

Think of all the rectangles whose perimeters are 8 units. If x represents the width and y represents the length, then

$$2x + 2y = 8$$

expresses the relationship between the width and length for all such rectangles.

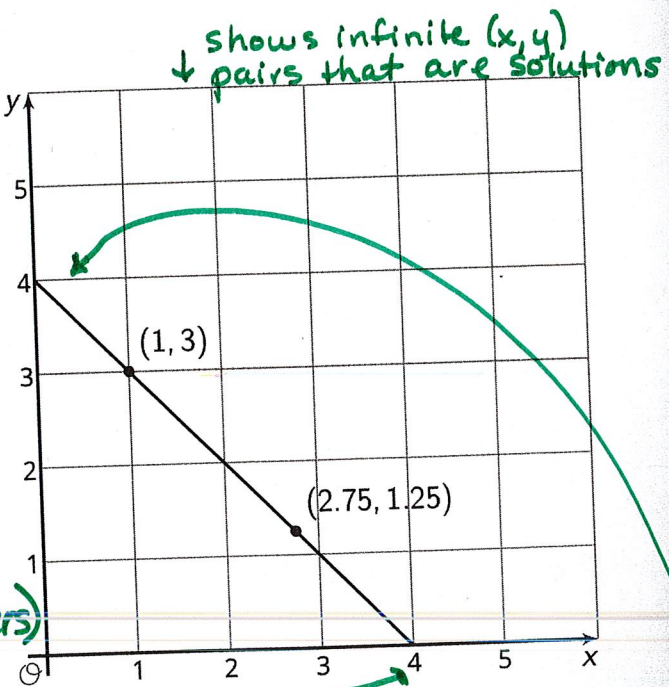
For example, the width and length could be 1 and 3, since $2 \cdot 1 + 2 \cdot 3 = 8$ or the width and length could be 2.75 and 1.25, since $2 \cdot (2.75) + 2 \cdot (1.25) = 8$.

We could find many other possible pairs of width and length, (x, y) , that make the equation true—that is, pairs (x, y) that when substituted into the equation make the left side and the right side equal.

A solution to an equation with two variables is any pair of values (x, y) that make the equation true.

We can think of the pairs of numbers that are solutions of an equation as points on the coordinate plane. Here is a line created by all the points (x, y) that are solutions to $2x + 2y = 8$. Every point on the line represents a rectangle whose perimeter is 8 units. All points not on the line are not solutions to $2x + 2y = 8$.

They make a line.



* Points can be in other quadrants (negative numbers) and rational numbers (fractions, decimals)

Lesson 12 Glossary Terms

- solution to an equation with two variables

* Sometimes we do not graph these because they do not make sense in the context of our problem (negative apples or 1/2 people doesn't make sense)

* x and y intercepts are easy to find

x int.
 • make $y=0$ in equation
 $2x + 2(0) = 8$ simplify
 $2x = 8$
 $\frac{2x}{2} = \frac{8}{2}$ solve eqn.
 $x = 4$

y-int
 • make $x=0$ in equation
 $2(0) + 2y = 8$
 $2y = 8$
 $\frac{2y}{2} = \frac{8}{2}$
 $y = 4$

* Finding solutions from an equation is more accurate than finding solutions from a graph