Algebra 2
Unit: Geometry
Section: Geometry of Quadrilaterals

Example: The Algebra of Parallelograms

Problem:

Shown below is a parallelogram A B C D. Find the values of x and y given the following information. D O is equal to 3 x minus 3, O B is equal to x plus 11, the measure of angle A D C equals 7 y plus 5, and the measure of angle D C B equals 5 y plus 98.

Solution:

Let's start with the information given about the diagonal B D. One property of parallelograms is that the diagonals bisect each other.

Using the information given, we can set the expressions given for each segment equal to each other.

Using the information given, we can set the expressions equation to each other.

Three x minus three equals x plus eleven. Solve this equation.

When this equation is solved, we get x equals 7.

Now let's look at the information given about the angles. Another property of parallelograms is that consecutive angles are supplementary.

Based on the property, we can say the measure of angle ADC plus the measure of angle DCB equals 180.

Using the information given, we can substitute the expressions for the measure of each angle into this equation.

Seven y plus 5 plus five y plus 103 equals 180. Solve this equation.

When this equation is solved, we get y equals 6.

You can easily check to see if your x and y values are correct by substituting them into the given expressions to see if the values fit the properties of parallelograms.