Example: Parallelograms: Properties of Their Sides

Problem:

Find the side lengths of parallelogram QRST. RS is equal to 3x plus 1. ST is equal to 3y plus 2. TQ is equal to 5x minus 11. QR is equal to 6y minus 7.

Solution:
Recall that opposite sides of a parallelogram are congruent. This means that side RS is equal to side QT, and side QR is equal to TS. In order to find the side lengths, find the value of x and y.

To find the value of x, set side RS and QT equal to each other. 3x plus 1 equals 5x minus 11

Subtract 3x from both sides. 1 equals 2x minus 11.

Add 11 to both sides. 12 equals 2x

6 equals x

Side RS is equal to 3x plus 1. To find the side length of RS, substitute the value of 6 for x into the equation. 3 times 6 plus 1. Side RS equals 19.

Opposite sides of a parallelogram are congruent. RS is congruent to QT. Therefore, RS and QT equal 19.

To find the value of y, set side QR and TS equal to each other. 6y minus 7 equals 3y plus 2

Subtract 3y from both sides. 3y minus 7 equals 2.

Add 7 to both sides. 3y equals 9.

Divide both sides by 3. y equals 3.

Side QR is equal to 6y minus 7. To find the side length of QR, substitute the value of 3 for y into the equation. 6 times 3 minus 7 equals 11. Side QR equals 11.

Opposite sides of a parallelogram are congruent. QR is congruent to ST. Therefore, QR and ST equal 11.