**Example: Similar Polygons**

**Problem:**

Quadrilateral WXYZ is similar to quadrilateral KLMN. The measure of angle X is 130 degrees, the measure of angle Y is 50 degrees, the measure of angle z is 73.2 degrees and the measure of angle W is 'a' degrees. Side WX measures 6.9, side XY measures 15, side YZ measures 20 and side ZW measures 12. The measure of angle K is '2b plus 5' degrees, side LM measures 9, side MN measures '3c plus 4' and side NK measures '2d minus 3'.
Find the value of a, b, c and d.

**Solution:**

The sum of the angles in a quadrilateral is 360 degrees.

This means that 130 plus 50 plus 73.2 plus a equals 360.

Solve this equation to get 253.2 plus a equals 360, which means that a equals 106.8.

Corresponding angles in similar polygons are congruent.

The measure of angle K is equal to the measure of angle W.

2b plus 5 equals 106.8

Solve this equation to get 2b equals 101.8, which means that b equals 50.9.

Corresponding sides in similar triangles are proportional.

This means that the ratio of side XY to side LM is equal to the ratio of side YZ to side MN.

Using the information given, this means that the ratio of 15 to 9 equals the ratio of 20 to the sum of 3c plus 4.

Cross multiply to get 15 times the sum of 3c plus 4 equals 9 times 20.

Distribute. 45 c plus 60 equals 180.

Solve this equation to get 45 c equals 120, which means that c is approximately equal to 2.67.

Use proportions again to solve for d, this time using sides ZW and NK.

The ratio of 15 to 9 equals the ratio of 12 to the quantity 2d minus 3.

Cross multiply to get 15 times the quantity 2d minus 3 equals 9 times 12.

Distribute. 30 d minus 45 equals 108.

Solve this equation to get 30d equals 153, which means that d equals 5.1.