

Example: Similar Triangles**Problem:**

Find the value of a , b and c . Triangle XYZ is similar to triangle LMN. Angle X measures 85.5 degrees. Angle Y measures 56 degrees. Angle Z measures 38.5 degrees. Side XY measures 15. Side YZ measures 24. Side XZ measures 20. Angle L measures a degrees. Angle N measures $2b$ plus 5 degrees. Side LM measures 9. Side MN measures $3c$ plus 4.

Solution:

Because both X and L are listed first in naming the similar triangles, we know that these angles are congruent.

A equals 85.5.

Because both N and Z are listed last in naming the similar triangles, we know that these angles are congruent.

Using the information in the triangles, $2b$ plus 5 equals 38.5.

Solve this equation to get b equals 16.75.

Since the triangles are similar, pairs of corresponding sides are proportional. This means that the ratio of side XY to side LM equals the ratio of side YZ to side MN.

Using the information given, 15 divided by 9 equals 24 divided by the quantity $3c$ plus 4.

Cross multiply to get 15 times the quantity $3c$ plus 4 equals 9 times 24.

Distributing gives us $45c$ plus 60 equals 216.

Solve this to get c equals 3.47.