Answer on Question #42399 – Math – Geometry

Question:

Two triangles can be formed with the given information. Use the Law of Sines to solve the triangles.

C = 67°, a = 21, c = 20.

Answer:

The Law of Sines is very useful for solving triangles:

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

where a, b and c are sides; A, B, C are angles.

$$\frac{21}{\sin \mathrm{A}} = \frac{\mathrm{b}}{\sin B} = \frac{20}{sin67°}$$

Then

$$\sin A = \frac{21 \times sin67°}{20} = 0.967 \approx 0.97$$

A = arc(sin(0.97)) = 75.93° ≈ 76°

Now we can calculate angel B. As you know in a triangle, the three angles always add to 180°.
A + B +C = 180

76°+B +67° =180°

B =37**°.**

Then

$$\frac{\mathrm{b}}{\sin 37\,°} = \frac{20}{sin67°}$$

$$b = \frac{20 \times sin37°}{sin67°} = 13.1 \approx 13$$

Answer:

b = 13; A =76°; B =37°.