Answer on question 42447 – Math - Geometry

Question:

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

A = 59°, a = 13, b = 14

Solution:

According to the Law of Sines we get

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

Or

$$\frac{13}{\sin 59°} = \frac{14}{\sin B} = \frac{c}{\sin C}$$

$$\frac{13}{\sin 59°} \approx 15.2,$$

$$\frac{14}{\sin B} \approx 15.2 \;\Rightarrow\; \sin B = 0.9 \;\Rightarrow\; B \approx 67° \; or \; B \approx 113°$$

As we know $A + B + C = 180°$ that is why $C = 180° - 59° - 67° = 54° \;\; or \;\; C = 8°$.

And

$$\frac{c}{\sin 54°} \approx 15.2 \;\Rightarrow\; c \approx 12.3 \;\; or \;\; \frac{c}{\sin 8°} \approx 15.2 \;\Rightarrow\; c \approx 2.$$

Answer: 1) $\mathrm{A} = 59°, \mathrm{B} = 67°, \mathrm{C} = 54°, \; \mathrm{a} = 13, \mathrm{b} = 14, \mathrm{c} = 12.3.$

2) $\mathrm{A} = 59°, \mathrm{B} = 113°, \mathrm{C} = 8°, \mathrm{a} = 13, \mathrm{b} = 14, \mathrm{c} = 2.$