

Answer on Question #53920 – Math – Trigonometry

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

$$A = 55^\circ, a = 12, b = 14$$

Solution

By the Law of Sines

$$\frac{\sin A}{a} = \frac{\sin B}{b} \rightarrow \sin B = b \frac{\sin A}{a} \rightarrow \text{angle } B = \sin^{-1} \left(b \frac{\sin A}{a} \right).$$

$$B = \sin^{-1} \left(14 \frac{\sin 55^\circ}{12} \right) = 72.877^\circ \text{ or } 180^\circ - 72.877^\circ = 107.123^\circ.$$

A, B, C are angles of triangle, therefore angle

$$C = 180^\circ - (55^\circ + 72.877^\circ) = 52.123^\circ \text{ or } 17.877^\circ.$$

The length of side

$$c = a \frac{\sin C}{\sin A} = 12 \frac{\sin 52.123^\circ}{\sin 55^\circ} = 11.563 \text{ or } 12 \frac{\sin 17.877^\circ}{\sin 55^\circ} = 4.497.$$