Answer on question 42401 – Math - Calculus

The given measurements may or may not determine a triangle. If not, then state that no triangle is formed. If a triangle is formed, then use the Law of Sines to solve the triangle, if it is possible, or state that the Law of Sines cannot be used.

B = 153°, c = 10, b = 14

Help me please

Answer.

From the Law of Sine: $\frac{sinC}{c} = \frac{sinB}{b} \rightarrow \ sinC = \frac{c}{b} sinB = \frac{10}{14} sin153^o = 0.3243 < 1.$

Therefore, the given measurements determine a triangle.

Equation $sinC = 0.3243$ has two solutions: $C = 19^o$ and $C = 161^o,$ but because

$161^o + 153^o > 180^o,$ the only solution is $C = 19^o$.

So, angle $A = 180^o - 153^o - 19^o = 8^o.$

From the Law of Sine: $\frac{sinA}{a} = \frac{sinB}{b} \rightarrow \ a = b\frac{sinA}{sinB} = 14\frac{sin8^o}{sin153^o} = 14\frac{0.1392}{0.4540} = 4.29.$

Finally, we have: $a = 4.29,\ b = 14,\ c = 10,\ \angle A = 8^o,\ \angle B = 153^o,\ \angle C = 19^o.$