Prove that sin(b-c)+bsin(c-a)+csin(a-b)=0

Solution.

This statement is not correct.

For example, $a = \frac{\pi}{2}, b = \frac{\pi}{3}, c = \frac{\pi}{6}$.

Then

$b - c = \frac{\pi}{6},$

$c - a = -\frac{\pi}{3},$

$a - b = \frac{\pi}{6}.$

We obtain

$$\sin\frac{\pi}{6} + \frac{\pi}{3}\sin\left(-\frac{\pi}{3}\right) + \frac{\pi}{6}\sin\frac{\pi}{6} = 0$$

$$\frac{1}{2} - \frac{\pi}{3}\frac{\sqrt{3}}{2} + \frac{\pi}{6}\frac{1}{2} = 0$$

Multiply both parts of equation by 12:

$$6 - 2\sqrt{3}\pi + \pi = 0$$

$$6 + \left(1 - 2\sqrt{3}\right)\pi = 0 \text{ - It is false.}$$

Answer.

The statement is not correct.