

2.6.21 Matgeo

AI25BTECH11012 - Garige Unnathi

Question

Find if a triangle ABC can be constructed in which $AB = 5\text{cm}$, $\angle A = 45^\circ$ and $BC + AC = 5\text{cm}$.

Solution

The area of a triangle ABC is given by : Given that :

$$a + b = 5cm$$

We need to find b. Using the Law of Cosines, we have:

$$a^2 = b^2 + c^2 - 2bc \cos(A) \quad (1)$$

$$a^2 = b^2 + 25 - \frac{10b}{\sqrt{2}} \quad (2)$$

Solution

We know $a = 5 - b$, substituting we get :

$$(5 - b)^2 = b^2 + 25 - \frac{10b}{\sqrt{2}} \quad (3)$$

(4)

solving the equation we get :

$$b = 0 \quad (5)$$

Hence we cannot form a triangle with the given conditions.