3.2.28

AI25BTECH11012 - GARIGE UNNATHI

Question:
Find if a triangle ABC can be constructed in which AB = 5cm, $\angle\mathbf{A} = 45°$ and BC+AC= 5cm. **Solution:**

Variable	Parameter	Value
$\boldsymbol{AB}$	c	5 cm
$\boldsymbol{BC}$	a	-
$\boldsymbol{AC}$	b	-
$\angle\mathbf{A}$	-	45°

TABLE 0: Variables Used

Given that :

$$a + b = 5cm$$

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

$$a^2 = b^2 + c^2 - 2bc\cos(A) \tag{0.1}$$

$$a^2 = b^2 + 25 - \frac{10b}{\sqrt{2}} \tag{0.2}$$

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

$$(5-b)^2 = b^2 + 25 - \frac{10b}{\sqrt{2}} \tag{0.3}$$

$$\tag{0.4}$$

solving the equation we get :

$$b = 0 \tag{0.5}$$

Hence we cannot form a triangle with the given conditions.