3.2.28

AI25BTECH11012 - GARIGE UNNATHI

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

Variable	Parameter	Value
$\|\|\mathbf{B}-\mathbf{A}\|\|$	c	5 cm
$\|\|\mathbf{C}-\mathbf{B}\|\|$	a	-
$\|\|\mathbf{C}-\mathbf{A}\|\|$	b	-
$\angle\mathbf{A}$	-	45°

TABLE 0: Variables Used

Given that :

$$a + b = 5cm$$
$$c = 5cm$$

Using the triangle inequality, for any triangle ABC :

$$\|\mathbf{B}-\mathbf{A}\| < \|\mathbf{C}-\mathbf{B}\| + \|\mathbf{C}-\mathbf{A}\|. \tag{0.1}$$
$$c < a + b \tag{0.2}$$

Which is not true.

Hence we cannot form a triangle with the given conditions.