3.2.28 Matgeo

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Question

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

Given

Given that :

$$\|\mathbf{B} - \mathbf{A}\| = c \quad \|\mathbf{C} - \mathbf{B}\| = a \quad \|\mathbf{C} - \mathbf{A}\| = b$$

$$a + b = 5cm$$

$$c = 5cm$$

Solution

Using the triangle inequality, for any triangle ABC :

$$\|\mathbf{B} - \mathbf{A}\| < \|\mathbf{C} - \mathbf{B}\| + \|\mathbf{C} - \mathbf{A}\|. \tag{1}$$

$$c < a + b \tag{2}$$

Which is not true.
Hence we cannot form a triangle with the given conditions.