

3-3.2-15

AI24BTECH11012 - Pushkar Gudla

Question: The construction of a $\triangle ABC$, given that $BC = 6\text{cm}$, $\angle B = 45^\circ$ is not possible when difference of **AB** and **AC** is equal to

- 1) 6.9cm
- 2) 5.2cm
- 3) 5.0cm
- 4) 4.0cm

Solution: Using the cosine formula in $\triangle ABC$,

Variable	Description
a	Length of side BC = 6cm
b	Length of side AC
c	Length of side AB
k	$k = b - c$
$\angle B$	45°

TABLE 4: Variables and given data

$$b^2 = a^2 + c^2 - 2ac \cos B \quad (4.1)$$

$$(k + c)^2 = a^2 + c^2 - 2ac \cos B \quad (4.2)$$

$$\Rightarrow c = \frac{a^2 - k^2}{2(k + a \cos B)} \quad (4.3)$$

$$c = \frac{36 - k^2}{2(k + 3\sqrt{2})} \quad (4.4)$$

Therefore, $k \leq 6\text{cm}$.

