

3-3.2-15

AI24BTECH11012 - Pushkar Gudla

Question: The construction of a triangle ABC , given that $BC = 6cm$, $\angle B = 45^\circ$ 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

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

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

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

$$a = 6cm \quad (4.4)$$

$$\angle B = 45^\circ \quad (4.5)$$

$$c = \frac{36 - k^2}{2(k + 3\sqrt{2})} \quad (4.6)$$

$$(4.7)$$

Therefore, $k \leq 6cm$.



