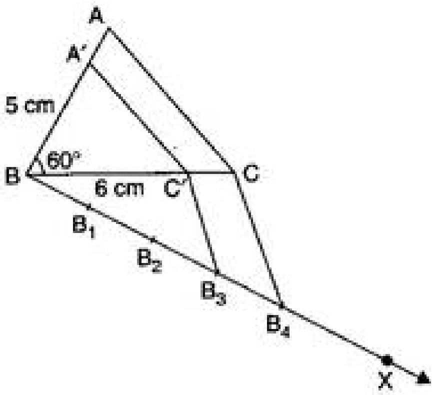
Exercise 11.1



(a) Draw a triangle ABC with side BC = 6 cm, AB = 5 cm and $\angle$ ABC = 60°.

(b) From any ray BX, making an acute angle with BC on the side opposite to the vertex A.

(c) Locate 4 points $B_1, B_2, B_3 and\ B_4$ on BX such that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4$.

(d) Join B_4C and draw a line through the point B_3, draw a line parallel to B_4C intersecting BC at the point C'.

(e) Draw a line through C' parallel to the line CA to intersect BA at A'.

Then, A'BC' is the required triangle.

Justification:

$\because B_4C \parallel B_3C'$ [By construction]

$$\therefore \frac{BB_3}{BB_4} = \frac{BC'}{BC}$$

[By Basic Proportionality Theorem]

But $\frac{BB_3}{BB_4} = \frac{3}{4}$ [By construction]

Therefore, $\frac{BC'}{BC} = \frac{3}{4}$ ....(i)

$\because$ CA || C'A' [By construction]

$\therefore$ Δ BC'A' ~ Δ BCA [AA similarity]

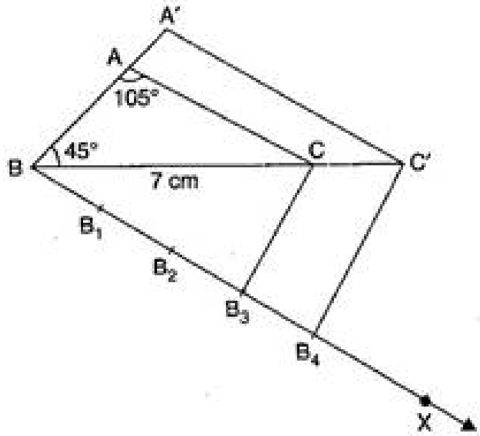
$\therefore \frac{AB'}{AB} = \frac{A'C'}{AC} = \frac{BC'}{BC} = \frac{3}{4}$ [From eq. (i)]

Q6. Draw a triangle ABC with side BC = 7 cm, $\angle$ B = 45°, $\angle$ A = 105°. Then construct a triangle whose sides are $\frac{4}{3}$ times the corresponding sides of ΔABC.

Ans: To construct: To construct a triangle ABC with side BC = 7 cm, $\angle$ B = 45° and $\angle$ C = 105° and then a triangle similar to it whose sides are

$\frac{4}{3}$ of the corresponding sides of the first triangle ABC.

Steps of construction:



(a) Draw a triangle ABC with side BC = 7 cm, ∠B = 45° and ∠C = 105°.

(b) From any ray BX, making an acute angle with BC on the side opposite to the vertex A.

(c) Locate 4 points $B_1, B_2, B_3 and\ B_4$ on BX such that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4$.

(d) Join B_3C and draw a line through the point B_4, draw a line parallel to B_3C intersecting BC at the point C'.

(e) Draw a line through C' parallel to the line CA to intersect BA at A'.

Then, A'BC' is the required triangle.

Justification:

$\because B_4C' \parallel B_3C$ [By construction]

$\therefore \Delta BB_4C' \sim \Delta BB_3C$ [AA similarity]

$$\therefore \frac{BB_4}{BB_3} = \frac{BC'}{BC}$$

[By Basic Proportionality Theorem]

But $\frac{BB_4}{BB_3} = \frac{4}{3}$ [By construction]

Therefore, $\frac{BC'}{BC} = \frac{4}{3}$ ....(i)

$\because$ CA $\parallel$ C'A' [By construction]

$\therefore \Delta$ BC'A' ~ Δ BCA [AA similarity]

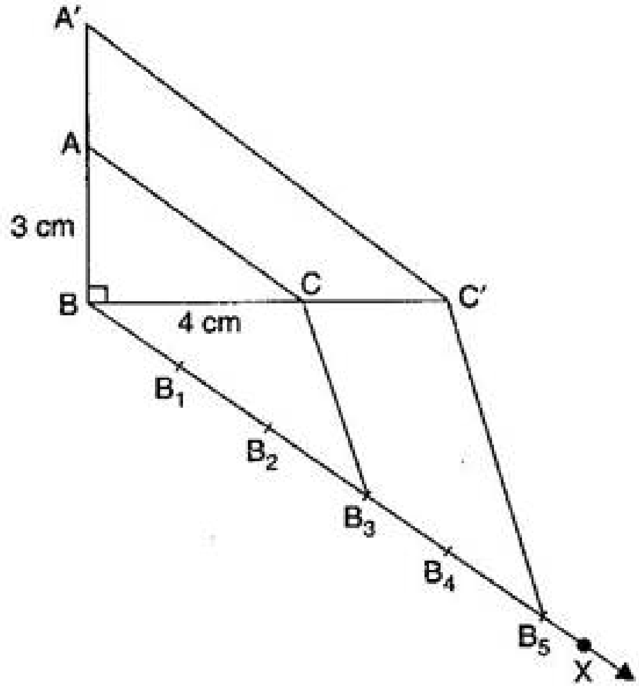
$$\therefore \frac{A'B}{AB} = \frac{A'C'}{AC} = \frac{BC'}{BC} = \frac{4}{3}$$ [From eq. (i)]

Q7. Draw a right triangle in which the sides (other than hypotenuse) are of lengths 4 cm and

3 cm. Then construct another triangle whose sides are $\frac{5}{3}$ times the corresponding sides of the given triangle.

Ans: To construct: To construct a right triangle in which sides (other than hypotenuse) are of lengths 4 cm and 3 cm and then a triangle similar to it whose sides are $\frac{5}{3}$ of the corresponding sides of the first triangle ABC.

Steps of construction:



(a) Draw a right triangle in which sides (other than hypotenuse) are of lengths 4 cm and 3 cm.

(b) From any ray BX, making an acute angle with BC on the side opposite to the vertex A.

(c) Locate 5 points $B_1, B_2, B_3, B_4 and B_5$ on BX such that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4 = B_4B_5$.

(d) Join B_3C and draw a line through the point B_5, draw a line parallel to B_3C intersecting BC at the point C'.

(e) Draw a line through C' parallel to the line CA to intersect BA at A'.

Then, A'BC' is the required triangle.

Justification:

$\because B_5C' \parallel B_3C$ [By construction]

$\therefore \Delta BB_5C' \sim \Delta BB_3C$ [AA similarity]

$\therefore \dfrac{BB_5}{BB_3} = \dfrac{BC'}{BC}$

[By Basic Proportionality Theorem]

But $\dfrac{BB_5}{BB_3} = \dfrac{5}{3}$ [By construction]

Therefore, $\dfrac{BC'}{BC} = \dfrac{5}{3}$ ....(i)

$\because$ CA $\parallel$ C'A' [By construction]

$\therefore \Delta$ BC'A' ~ Δ BCA [AA similarity]

$\therefore \dfrac{A'B}{AB} = \dfrac{A'C'}{AC} = \dfrac{BC'}{BC} = \dfrac{5}{3}$ [From eq. (i)]

*********** END *********