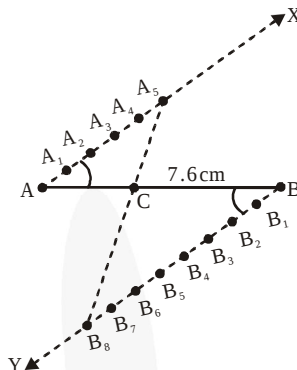


Ex - 11.1

Q1. Draw a line segment of length 7.6 cm and divide it in the ratio 5 : 8. Measure the two parts.

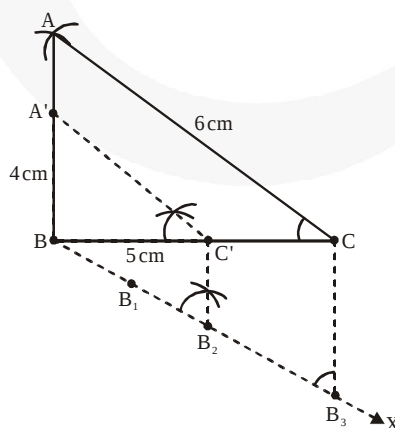
Sol. Steps of construction :



1. Draw $AB = 7.6$ cm.
2. AX is any ray making an acute angle with AB above the line AB .
3. Draw ray BY below the line AB and parallel to the ray AX by constructing $\angle ABY = \angle BAX$.
4. Mark points $A_1, A_2, \dots, A_5$ on AX and $B_1, B_2, \dots, B_8$ on BY such that $AA_1 = A_1A_2 = \dots = A_4A_5 = BB_1 = B_1B_2 = \dots = B_7B_8$.
5. Join A_5B_8 . It intersects AB at C .
Now, C divides AB in the ratio 5 : 8.

Q2. Construct a triangle of sides 4 cm, 5 cm and 6 cm and then a triangle similar to it whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.

Sol. Steps of construction :

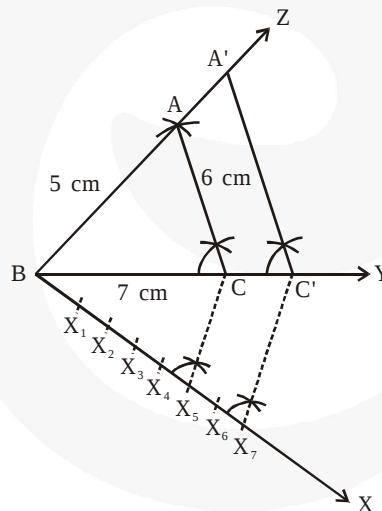


1. Construct $\triangle ABC$, such that $AB = 4$ cm,
 $BC = 5$ cm and $CA = 6$ cm.
 2. Draw any ray BX making an acute angle with BC (below the side BC).
 3. Mark three points B_1, B_2, B_3 on BX such that
 $BB_1 = B_1B_2 = B_2B_3$.
 4. Join B_3C
 5. Through B_2 draw $B_2C' \parallel B_3C$ and let it intersect
 BC at C' .
 6. Through C' draw $C'A' \parallel CA$ and let it intersect
 BA at A' .
- $\triangle A'BC'$ is the required triangle similar to the given $\triangle ABC$ whose side are $\frac{2}{3}$ of the corresponding sides of the $\triangle ABC$.

Q3. Construct a triangle with sides 5 cm, 6 cm and 7 cm and then another triangle whose sides are $\frac{7}{5}$ of the corresponding sides of the first triangle.

Sol. Steps of Construction :

1. Construct a $\triangle ABC$ such that $AB = 5$ cm,
 $BC = 7$ cm and $AC = 6$ cm.

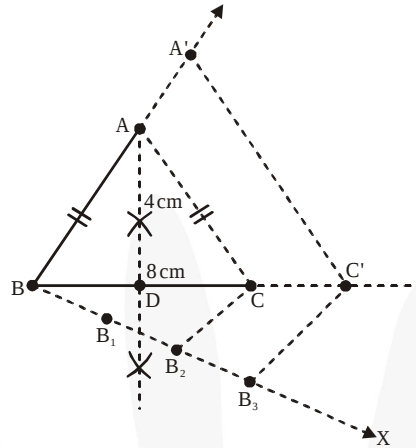


2. Draw a ray BX such that $\angle CBX$ is an acute angle.
3. Mark 7 points $X_1, X_2, X_3, X_4, X_5, X_6$ and X_7 on BX such that $BX_1 = X_1X_2 = X_2X_3 = X_3X_4 = X_4X_5 = X_5X_6 = X_6X_7$
4. Join X_5 to C .
5. Draw a line through X_7 intersecting BC (produced) at C' such that $X_5C \parallel X_7C'$
6. Draw a line through C' parallel to CA to intersect BA (produced) at A' .

Thus, $\triangle A'BC'$ is the required triangle.

- Q4.** Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then another triangle whose sides are $1\frac{1}{2}$ times the corresponding sides of the isosceles triangle.

Sol. Steps of construction :



1. Construct isosceles $\triangle ABC$ such that $BC = 8$ cm and altitude $AD = 4$ cm.
2. Draw any ray BX making an acute angle with BC
3. Take B_1, B_2, B_3 on BX such that $BB_1 = B_1B_2 = B_2B_3$.
4. Join B_2C .
5. Through B_3 draw $B_3C' \parallel B_2C$ and let it intersect BC (produced) at C' .
6. Through C' draw, $C'A' \parallel CA$ and let it intersect BA (produced) at A' .

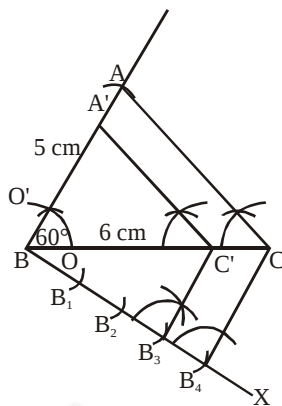
Now, $\triangle A'BC'$ is the required triangle whose side are $1\frac{1}{2}$ times the corresponding sides of the $\triangle ABC$.

- Q5.** Draw a triangle ABC with side $BC = 6$ cm, $AB = 5$ cm and $\angle ABC = 60^\circ$.

Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC .

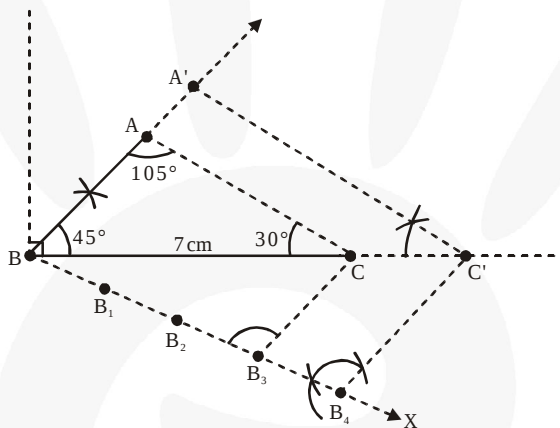
Sol. Steps of construction :

1. Draw a $\triangle ABC$ with side $BC = 6$ cm, $AB = 5$ cm and $\angle ABC = 60^\circ$.
2. Draw a ray BX making an acute angle with BC on the opposite side of vertex A .
3. Mark 4 points (as 4 is greater in 3 and 4), B_1, B_2, B_3, B_4 , on line segment BX such that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4$.
4. Join B_4C and draw a line through B_3 , parallel to B_4C intersecting BC at C' .
5. Draw a line through C' parallel to AC intersecting AB at A' . $\triangle A'BC'$ is the required triangle.



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

Sol. Steps of construction :



1. Construction $\triangle ABC$ such that $BC = 7$ cm,
 $\angle ABC = 45^\circ$ and $\angle ACB = 30^\circ$ (i.e., $\angle BAC = 105^\circ$).
2. Draw any ray BX making an acute angle with BC .
3. Take points B_1, B_2, B_3, B_4 on BX such that
 $BB_1 = B_1B_2, B_2B_3 = B_3B_4$.
4. Join B_3C .
5. Through B_4 draw $B_4C' \parallel B_3C$ and let it intersect BC (produced) at C' .
6. Through C' draw, $C'A' \parallel CA$ and let it intersect BA (produced) at A' .

Now, $\triangle A'B'C'$ is the required triangle whose sides are $\frac{4}{3}$ times the corresponding sides of the $\triangle ABC$.

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.

Sol. Steps of construction :

1. Draw a line segment $AB = 4$ cm. Draw a ray SA making 90° with it.
2. Draw an arc of 3 cm radius while taking A as its centre to intersect SA at C . Join BC . $\triangle ABC$ is the required triangle.
3. Draw a ray AX making an acute angle with AB , opposite to vertex C .
4. Mark 5 points (as 5 is greater in 5 and 3), A_1, A_2, A_3, A_4, A_5 , on line segment AX such that $AA_1 = A_1A_2 = A_2A_3 = A_3A_4 = A_4A_5$.
5. Join A_3B . Draw a line through A_5 parallel to A_3B intersecting extended line segment AB at B' .
6. Through B' , draw a line parallel to BC intersecting extended line segment AC at C' . $\triangle AB'C'$ is the required triangle.

