EXERCISE 10.2

Write True or False and give reasons for your answer in each of the following:

1. By geometrical construction, it is possible to divide a line segment in the ratio $\sqrt{3}:(1/\sqrt{3})$

Solution:

True

Justification:

According to the question,

Ratio= $\sqrt{3} : (1/\sqrt{3})$

On simplifying we get,

$\sqrt{3}/ (1/\sqrt{3}) = (\sqrt{3} \times \sqrt{3})/1 = 3:1$

Required ratio = 3:1

Hence,

Geometrical construction is possible to divide a line segment in the ratio 3:1.

2. To construct a triangle similar to a given △ABC with its sides 7/3 of the corresponding sides of △ABC, draw a ray BX making acute angle with BC and X lies on the opposite side of A with respect to BC. The points B1, B2,...., B7 are located at equal distances on BX, B3 is joined to C and then a line segment B6C′ is drawn parallel to B3C where C′ lies on BC produced. Finally, line segment A′C′ is drawn parallel to AC.

Solution:

False

Justification:

Let us try to construct the figure as given in the question.

Steps of construction,

1. Draw a line segment BC.
2. With B and C as centres, draw two arcs of suitable radius intersecting each other at A.
3. Join BA and CA and we get the required triangle ΔABC.
4. Draw a ray BX from B downwards to make an acute angle ∠CBX.
5. Now, mark seven points B_1, B_2, B_3 ...B_7 on BX, such that $BB_1 = B_1B_2 = B_2B_3 = B_3B_4 = B_4B_5 = B_5B_6 = B_6B_7$.
6. Join B_3C and draw a line B_7C'|| B_3C from B_7 such that it intersects the extended line segment BC at C'.
7. Draw C'A' ||CA in such a way that it intersects the extended line segment BA at A'.

Then, ΔA'BC' is the required triangle whose sides are 7/3 of the corresponding sides of ΔABC.

According to the question,

We have,

Segment B_6C' || B_3C. But it is clear in our construction that it is never possible that segment B_6C'||B_3C since the similar triangle A'BC' has its sides 7/3 of the corresponding sides of triangle ABC.

So, B_7C' is parallel to B_3C.