

Conic Sections

11th Maths - Chapter 11

EXERCISE 10.1

Choose the correct answer from the given four options :

1. To divide a line segment AB in the ratio 5:7, first a ray AX is drawn so that $\angle BAX$ is an acute angle and then at equal distances points are marked on the ray AX such that the minimum number of these points is
 - (a) 8
 - (b) 10
 - (c) 11
 - (d) 12
2. To divide a line segment AB in the ratio 4:7, a ray AX is drawn first such that $\angle BAX$ is an acute angle and then points A_1, A_2, A_3, \dots are located at equal distances on the ray AX and the point B is joined to
 - (a) A_{12}
 - (b) A_{11}
 - (c) A_{10}
 - (d) A_9
3. To divide a line segment AB in ratio 5:6, draw a ray AX such that $\angle BAX$ is an acute angle, then draw a ray BY parallel to AX and the points A_1, A_2, A_3, \dots and B_1, B_2, B_3, \dots are located at equal distances on ray AX and BY , respectively, Then the points joined are

- (a) \mathbf{A}_5 and \mathbf{B}_6
 - (b) \mathbf{A}_6 and \mathbf{B}_5
 - (c) \mathbf{A}_4 and \mathbf{B}_5
 - (d) \mathbf{A}_5 and \mathbf{B}_4
4. To construct a triangle similar to a given $\triangle ABC$ with its sides $\frac{3}{7}$ of the corresponding sides of $\triangle ABC$, first draw a ray BX such that $\angle CBX$ is an acute angle and x lies on the opposite side of \mathbf{A} with respect to BC . Then locate points B_1, B_2, B_3, \dots on BX at equal distances and next step is to join
- (a) \mathbf{B}_{10} to \mathbf{C}
 - (b) \mathbf{B}_3 to \mathbf{C}
 - (c) \mathbf{B}_7 to \mathbf{C}
 - (d) \mathbf{B}_4 to \mathbf{C}
5. To construct a triangle similar to a given $\triangle ABC$ with its sides $\frac{8}{5}$ of the corresponding sides of $\triangle ABC$ draw a ray BX such that $\angle CBX$ is an acute angle and X is on the opposite side of \mathbf{A} with respect to BC . The minimum number of points to be located at equal distances on ray BX is
- (a) 5
 - (b) 8
 - (c) 13
 - (d) 3
6. To draw a pair of tangents to a circle which are inclined to each other at an angle of 60° , it is required to draw tangents at end points of those two radii of the circle, the angle between them should be
- (a) 135°
 - (b) 90°
 - (c) 60°
 - (d) 120°

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 $\sqrt{3}$: $\frac{1}{\sqrt{3}}$.
2. To construct a triangle similar to a given $\triangle ABC$ with its sides $\frac{7}{3}$ of the corresponding sides of $\triangle ABC$, draw a ray BX making acute angle with BC and x lies on the opposite side of A with respect to BC . The points B_1, B_2, \dots, B_7 are located at equal distances on BX , B_3 is joined to c and then a line segment B_6C' is drawn produced. Final line segment $A'C'$ is drawn parallel to AC .
3. A pair of tangents can be constructed from a point P to a circle of radius 3.5 cm situated at a distance of 3 cm from the centre.
4. A pair of tangents can be constructed to a circle inclined at an angle of 170° .

EXERCISE 10.3

1. Draw a line segment of length 7 cm. Find a point P on it which divides it in the ratio 3:5.
2. Draw a right triangle ABC in which $BC = 12$ cm, $AB = 5$ cm and $\angle B = 90^\circ$. Construct a triangle similar to it and of scale factor $\frac{2}{3}$. Is the new triangle also a right triangle ?
3. Draw a triangle ABC in which $BC = 6$ cm, $CA = 5$ cm and $AB = 4$ cm. Construct a triangle similar to it and of scale factor $\frac{5}{3}$.
4. Construct a tangent to a circle of radius 4 cm from a point which is at a distance of 6 cm from its centre.

EXERCISE 10.4

1. Two line segments AB and AC include an angle of 60° where $AB = 5$ cm and $AC = 7$ cm, respectively such that $AP = \frac{3}{4}AB$ and $AQ = \frac{1}{4}AC$. Join P and Q and measure the length PQ .
2. Draw a parallelogram $ABCD$ in which $BC = 5$ cm, $AB = 3$ cm and $\angle ABC = 60^\circ$, divide it into triangles ACB and ABD by the diagonal

BD . Construct the triangle $BD'C'$ similar to $\triangle BDC$ with scale factor $\frac{4}{3}$. Draw the line segment $D'A'$ parallel to DA where A' lies on extended side BA . Is $A'BC'D'$ a parallelogram?

3. Draw two concentric circles of radii 3 cm and 5 cm. Taking a point on outer circle construct the pair of tangents to the other. Measure the length of a tangent and verify it by actual calculation.
4. Draw an isosceles triangle ABC in which $AB=AC=6$ cm and $BC=6$ cm. Construct a triangle PQR similar to $\triangle ABC$ in which $PQ=8$ cm. Also justify the construction.
5. Draw a triangle ABC in which $AB=5$ cm, $BC=6$ cm and $\angle ABC=60^\circ$. Construct a triangle similar to $\triangle ABC$ with scale factor $\frac{5}{7}$. Justify the construction.
6. Draw a circle of radius 4 cm. Construct a pair of tangents to it, the angle between which is 60° . Also justify the construction. Measure the distance between the centre of the circle and the point of intersection of tangents.
7. Draw a triangle ABC in which $AB=4$ cm, $BC=6$ cm and $AC=9$. Construct a triangle similar to $\triangle ABC$ with scale factor $\frac{3}{2}$. Justify the construction. Are the two triangles congruent? Note that all the three angles and two sides of the two triangles are equal.