RS Aggarwal Solutions for Class 10 Maths Chapter 13 Exercise 13.2: Here, RS Aggarwal Solutions for Class 10 Maths Chapter 13 Exercise 13.2 provide detailed guidance on solving construction problems. This exercise focuses on geometric constructions involving angles, triangles, and various other shapes. The solutions provided in this chapter help students understand the step-by-step process of constructing accurate geometric figures based on given conditions.

By working through these solutions students can master the techniques of using a compass, ruler, and protractor to create precise drawings and solve construction problems effectively. This practice is important for building a solid foundation in geometric constructions and improving overall problem-solving skills.

RS Aggarwal Solutions for Class 10 Maths Chapter 13 Exercise 13.2 Overview

Here, RS Aggarwal Solutions for Class 10 Maths Chapter 13 Exercise 13.2 focuses on the practical aspects of geometric constructions.

Constructing Angles: Students are required to construct specific angles using a protractor or compass. This may involve drawing angles of a given measurement or angles that are congruent to each other.

Constructing Triangles: Problems often include constructing triangles given specific conditions, such as side lengths or angle measures. This helps students understand how to use geometric properties to create accurate figures.

Bisecting Angles: Another common task is to bisect given angles, which involves dividing an angle into two equal parts using a compass and straightedge.

Drawing Parallel Lines: Students may need to construct parallel lines through a given point, using geometric tools to ensure accuracy.

RS Aggarwal Solutions for Class 10 Maths Chapter 13 Exercise 13.2 PDF

The PDF link for RS Aggarwal Solutions for Class 10 Maths Chapter 13 Exercise 13.2 is available below.

By accessing this PDF, students can follow step-by-step solutions to effectively tackle the problems in the exercise, enhancing their understanding of geometric principles and improving their problem-solving skills. This valuable resource aids in thorough preparation and practice for mastering geometric constructions.

RS Aggarwal Solutions for Class 10 Maths Chapter 13 Constructions (Exercise 13B) Exercise 13.2

Below we have provided RS Aggarwal Solutions for Class 10 Maths Chapter 13 Exercise 13.2 for the ease of the students –

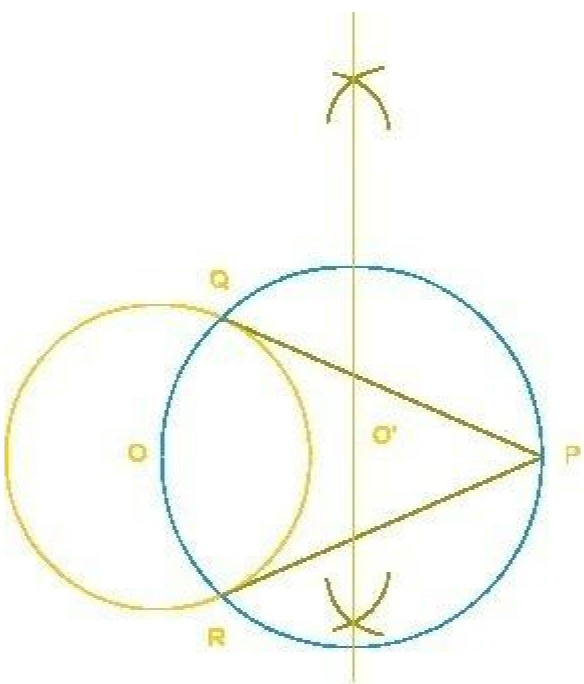
Q. Draw a circle of radius 3 cm. From a point P, 7 cm away from the centre of the circle, draw two tangents to the circle. Also, measure the lengths of the tangents.

Solution

Draw a circle with radius 3 cm and centre O.

Draw a line segment OP = 7 cm
Make perpendicular bisector of OP which intersects OP at point O'.
Take O'P as radius and draw another circle.
From point P, draw tangents to points of intersection between the two circles.

∴PQ=PR= cm



Q. Draw two tangents to a circle of radus 3.5 cm from a point P at a distance of 6.2 cm from its centre.

Solution

Steps of construction:

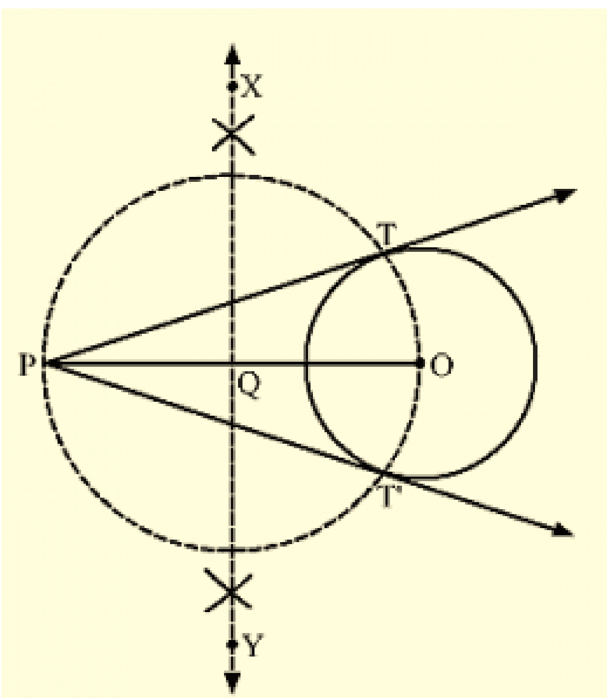
1. Draw a circle with O as a center and a radius of 3.5 cm.

2. Mark a point P outside the circle such that OP = 6.2 cm

3. Join OP. Draw the perpendicular bisector XY of OP, cutting OP at Q.

4. Draw a circle with Q as the center and radius PQ(or OQ), to intersect the given circle at the points, T and T`.

5. Join PT and PT`.

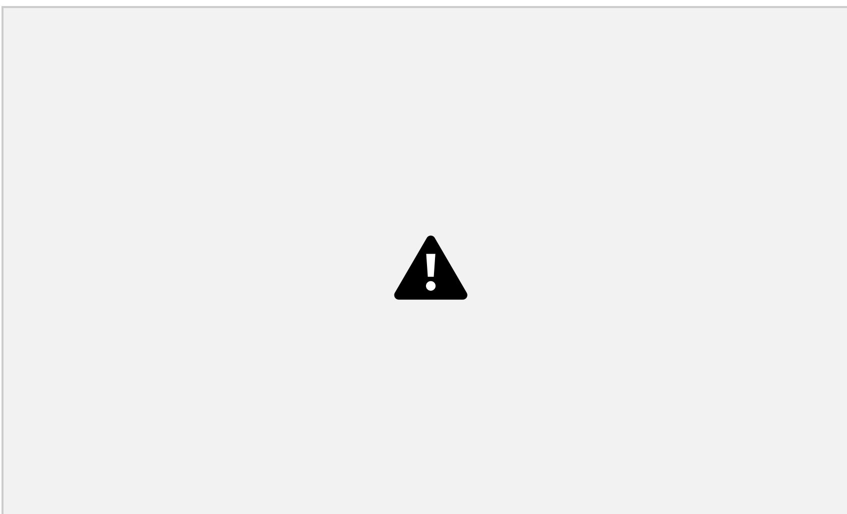


Here, PT and PT` are the required tangents.

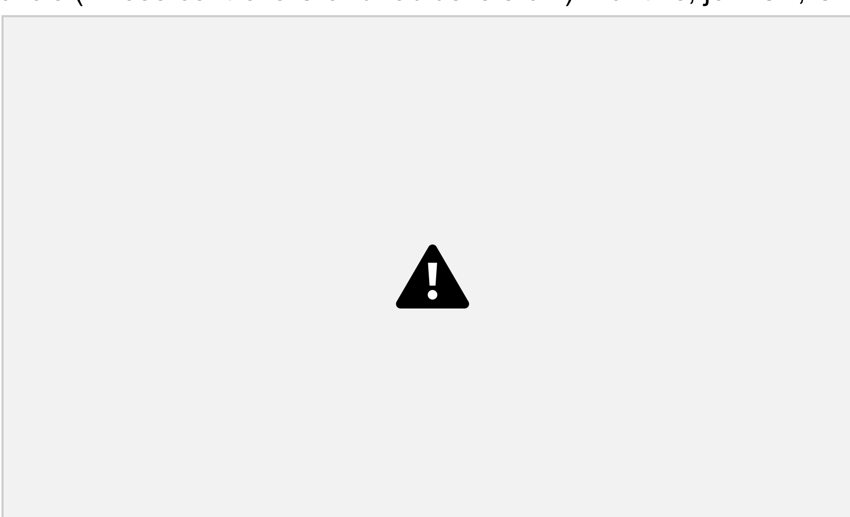
Q. Draw a circle of radius 3 cm. Take two points P and Q on one of its diameters extended on both sides, each at a distance of 7 cm on opposite sides of its centre. Draw tangents to the circle from these two points P and Q.

Solution

The tangent can be constructed on the given circle as follows.
Step 1
Taking any point O on the given plane as centre, draw a circle of 3 cm radius.
Step 2
Take one of its diameters, PQ, and extend it on both sides. Locate two points on this diameter such that OR = OS = 7 cm
Step 3
Bisect OR and OS. Let T and U be the mid-points of OR and OS respectively.
Step 4
Taking T and U as its centre and with TO and UO as radius, draw two circles. These two circles will intersect the circle at point V, W, X, Y respectively. Join RV, RW, SX, and SY. These are the required tangents.



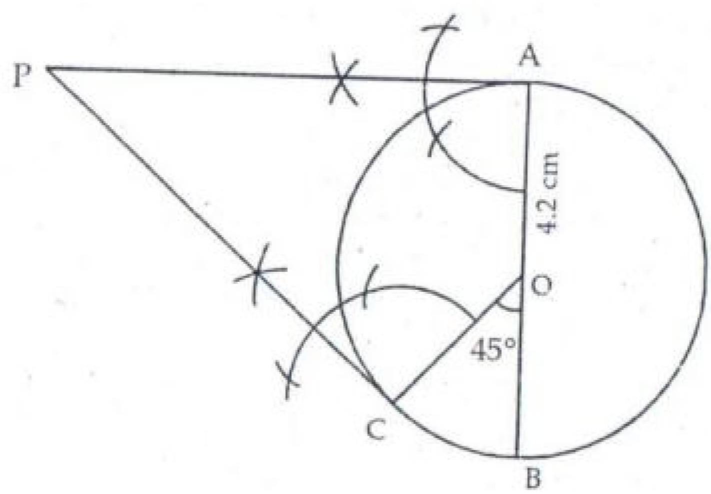
Justification
The construction can be justified by proving that RV, RW, SY, and SX are the tangents to the circle (whose centre is O and radius is 3 cm). For this, join OV, OW, OX, and OY.



∠RVO is an angle in the semi-circle. We know that angle in a semi-circle is a right angle.
∴ ∠RVO = 90°
⇒ OV ⊥ RV
Since OV is the radius of the circle, RV has to be a tangent of the circle. Similarly, OW, OX, and OY are the tangents of the circle.

Q. Draw a circle with centre O and radius 4 cm. Draw any diameter AB of this circle. Construct tangents to the circle at each of the two end points of the diameter AB.

Solution



Steps of Construction:

Step 1: A circle of radius 4.2 cm at center O is drawn.

Step 2: A diameter AB is drawn.

Step 3: With OB as the base, an angle BOC of 45 degree is drawn.

Step 4: At A, a line perpendicular to OA is drawn.

Step 5: AT C, a line perpendicular to OC is drawn.

Step 6: These lines intersect with each other at P.

PA and PC are the required tangents.

Q. Draw a circle with the help of a bangle. Take any point P outside the circle. Construct the pair of tangents from the point P to the circle.

Solution

The required tangents can be constructed on the given circle as follows.

Step 1

Draw a circle with the help of a bangle.

Step 2

Take a point P outside this circle and take two chords QR and ST.

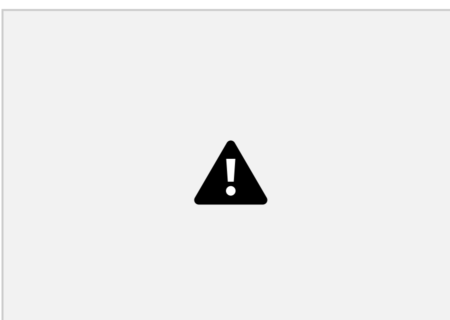
Step 3

Draw perpendicular bisectors of these chords. Let them intersect each other at point O.

Step 4

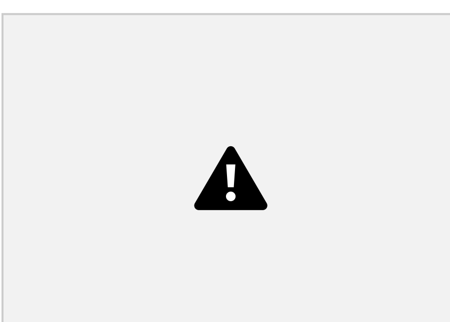
Join PO and bisect it. Let U be the mid-point of PO. Taking U as centre, draw a circle of radius OU, which will intersect the circle at V and W. Join PV and PW.

PV and PW are the required tangents.



Justification

The construction can be justified by proving that PV and PW are the tangents to the circle. For this, first of all, it has to be proved that O is the centre of the circle. Let us join OV and OW.



We know that perpendicular bisector of a chord passes through the centre. Therefore, the perpendicular bisector of chords QR and ST pass through the centre. It is clear that the intersection point of these perpendicular bisectors is the centre of the circle. $\angle PVO$ is an angle in the semi-circle. We know that an angle in a semi-circle is a right angle.

$\therefore \angle PVO = 90°$

$\Rightarrow OV \perp PV$

Since OV is the radius of the circle, PV has to be a tangent of the circle. Similarly, PW is a tangent of the circle.

Q. Draw a line segment AB of length 8 cm. Taking A as centre, draw a circle of radius 4 cm and taking B as centre, draw another circle of radius 3 cm. Construct tangents to each circle from the centre of the other circle.

Solution

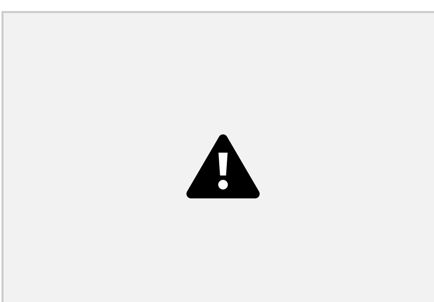
The tangents can be constructed on the given circles as follows.

Step 1

Draw a line segment AB of 8 cm. Taking A and B as centre, draw two circles of 4 cm and 3 cm radius.

Step 2

Bisect the line AB. Let the mid-point of AB be C. Taking C as centre, draw a circle of AC radius which will intersect the circles at points P, Q, R, and S. Join BP, BQ, AS, and AR. These are the required tangents.



Justification

The construction can be justified by proving that AS and AR are the tangents of the circle (whose centre is B and radius is 3 cm) and BP and BQ are the tangents of the circle (whose centre is A and radius is 4 cm). For this, join AP, AQ, BS, and BR.

∠ASB is an angle in the semi-circle. We know that an angle in a semi-circle is a right angle.

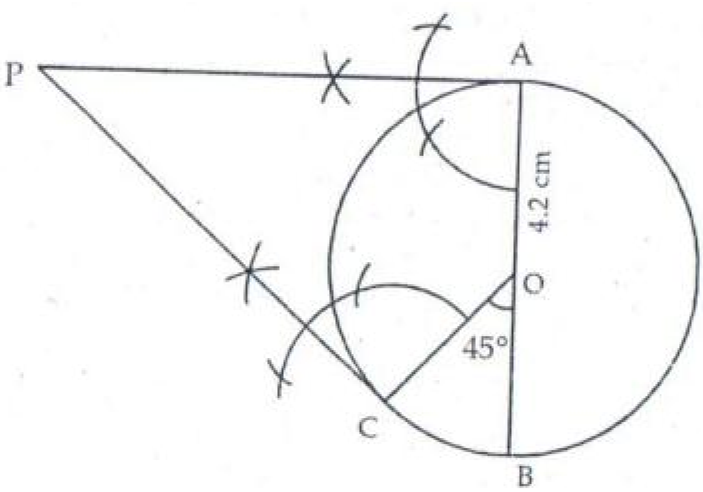
∴ ∠ASB = 90°

⇒ BS ⊥ AS

Since BS is the radius of the circle, AS has to be a tangent of the circle.

Q. Draw a circle of radius 4.2 cm. Draw a pair of tangents to this circle inclined to each other at an angle of 45◦.

Solution



Steps of Construction:

Step 1: A circle of radius 4.2 cm at center O is drawn.

Step 2: A diameter AB is drawn.

Step 3: With OB as the base, an angle BOC of 45 degree is drawn.

Step 4: At A, a line perpendicular to OA is drawn.

Step 5: AT C, a line perpendicular to OC is drawn.

Step 6: These lines intersect with each other at P.

PA and PC are the required tangents.

Q. Write the steps of construction for drawing a pair of tangents to a circle of radius 3 cm, which are inclined to each other at an angle of 60◦.

Solution

Following the given steps in order to construct the tangents.

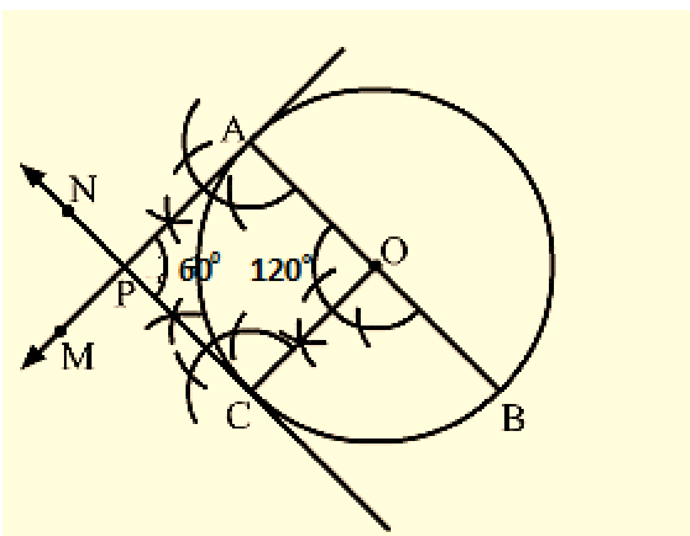
Step 1 : Draw a circle of radius 3 cm and centre O.

Step 2 : Take a point A on the circle. Join OA.

Step 3 : Draw a perpendicular to OA at A.

Step 4 : Draw a radius OB, making an angle of 120° (180° – 60°) with OA.

Step 5 : Draw a perpendicular to OB at point B. Let these perpendiculars intersect at P.



Here, PA and PB are the required tangents inclined at angle 60°

Q. Draw a circle of radius 3 cm. Draw a tangent to the circle making an angle of 30◦ with a line passing through the centre.

Solution

Steps Of construction:

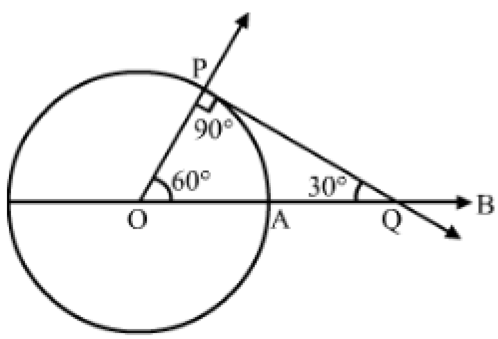
Step 1: Draw a circle with center O and radius 3 cm.

Step 2: Draw radius OA and produce it to B.

Step 3: Make angle AOP = 60.

Step 4: Draw PQ perpendicular to OP, meeting OB at Q.

Step 5: Then, PQ is the desired tangent, such that angle OQP = 30



Q. Construct a tangent to a circle of radius 4cm from a point on the concentric circle of radius 6cm and measure its length. Also, verify the measurement by actual calculation.

Solution

Steps of construction

1) Draw a circle of radius 4cm from the centre O. With same centre and radius equal to 6cm, construct another circle.

2) Take any point P on the circumference of the outer circle and join OP.

3) Construct perpendicular bisector for the line segment PO, which intersect OP at point M

4)Now, with M as centre, construct a circle of radius equal to PM or MO.

5) This circle now intersects the inner circle at points Q and R. Join PQ and PR.

6) Thus, tangents have been constructed from outer circle to the inner circle.

7) On measuring PR or PQ, we get PR=PR=4.4cm (approx)

Verification

PO acts as a diameter for the smallest circle and hence,

$\angle PQO=\angle PRO=90^\circ$ [Angle in the semi circle]

Thus, $OQ\perp PQ$ and $OR\perp PR$ hence, PQ and PR are tangents.

Consider, right ΔPQO

$\Rightarrow PO2=PQ2+OQ2$

$\Rightarrow 62=PQ2+42$

$\therefore PQ=\sqrt{36-16}=\sqrt{20}=4..47cm$ (approx)

Hence, verified.

Q. Draw two concentric circles of radii 3 cm and 5 cm. Taking a point on the outer circle, construct the pair of tangents to the inner circle.

Solution

Steps of construction of tangents:-
Step 1:
Take a point O and draw two concentric circles of radii 3 cm and 5 cm respectively.

Step 2:
Locate a point P on the circumference of larger circle.

Step 3:
Join OP and bisect it . Let M be the midpoint of OP.

Step 4:
Taking M as centre and MP(or MO) as radius,draw a circle intersecting smaller circle at A and B.

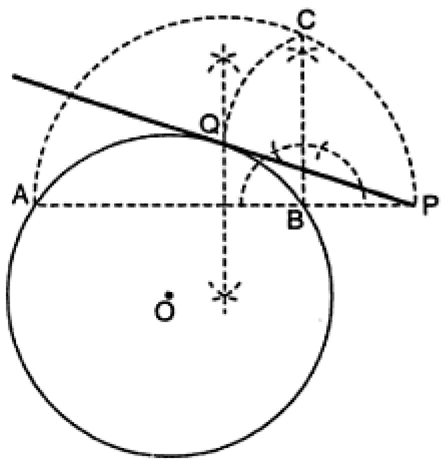
Step 5:
Join PA and PB .Thus PA and PB are the required tangents.

Q. Write the steps of construction to construct the tangents to a circle from an external point.

Solution

Steps of construction:
1) Take point O and draw a circle of radius 4 cm.
2) Take any point P out side the circle.
3) Through the external point P draw a straight line PBA meet the given circle at A and B.

4) With AP as diameter , draw a semicircle.
5) Draw BC $\perp$ AP, which intersects the semicircle at C.
6) With P as centre and radius PC draw an arc cutting the given circle at Q .Join PQ Then PQ is the required tangent.



Benefits of RS Aggarwal Solutions for Class 10 Maths Chapter 13 Exercise 13.2

- **Detailed Explanations**: These solutions provide clear step-by-step explanations, helping students understand the process of geometric constructions and apply these concepts effectively.
- **Improved Problem-Solving Skills**: By working through the solutions students can enhance their problem-solving abilities and gain confidence in handling various types of construction problems.
- **Conceptual Clarity**: The solutions help in reinforcing fundamental concepts of geometric constructions, ensuring that students grasp the underlying principles and methods.
- **Error Correction**: Students can identify and correct their mistakes by comparing their work with the provided solutions, leading to better learning and improved performance in exams.