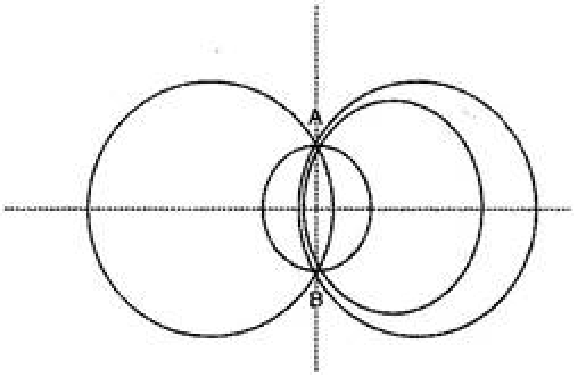
NCERT solutions for class 9 maths circles Ex 10.3

**Q1.** Draw different pairs of circles. How many points does each pair have in common? What is the maximum number of common points?

**Ans.** From the figure, we observe that when different pairs of circles are drawn, each pair have two points (say A and B) in common. Maximum number of common points are two in number.




Suppose two circles C (O,r ) and C (O', s) intersect each other in three points, say A, B and C.

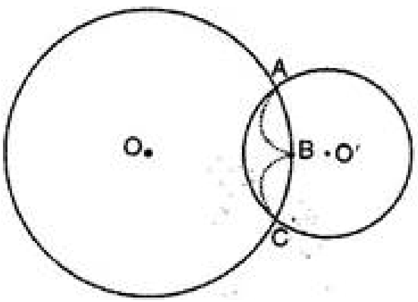
Then A, B and C are non-collinear points.

We know that:

There is one and only one circle passing through three non-collinear points.

Therefore, a unique circle passes through A, B and C.

$\Rightarrow$ O' coincides with O and $s = r$.



**Q2.** Suppose you are given a circle. Give a construction to find its centre.

**Ans. Steps of construction**:

**(a)** Take any three points A, B and C on the circle.

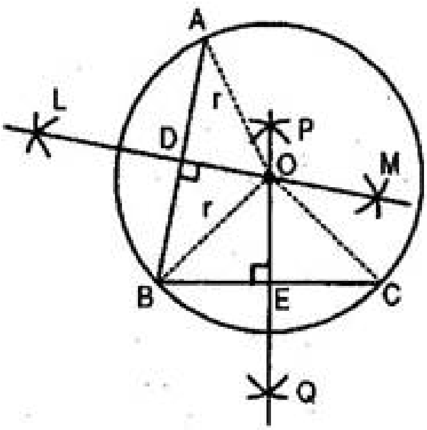
**(b)** Join AB and BC.

**(c)** Draw perpendicular bisector say LM of AB.

**(d)** Draw perpendicular bisector PQ of BC.

**(e)** Let LM and PQ intersect at the point O.

Then O is the centre of the circle.




**Verification**:

O lies on the perpendicular bisector of AB.

$\therefore$ OA = OB ..........(i)

O lies on the perpendicular bisector of BC.

$\therefore$ OB = OC ..........(ii)

From eq. (i) and (ii), we observe that

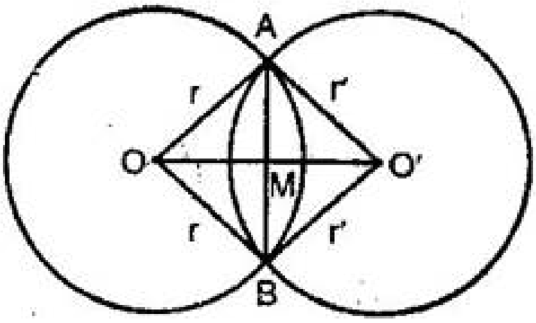
OA = OB = OC = $r$ (say)

Three non-collinear points A, B and C are at equal distance $(r)$ from the point O inside the circle.

Hence O is the centre of the circle.

**Q3.** If two circles intersect at two points, prove that their centres lie on the perpendicular bisector of the common chord.

**Ans. Given:** Let C (O, $r$) and C (O', $r'$) be two circles intersecting at A and B. AB is the common chord.




**To prove:** OO' is the perpendicular bisector of the chord AB.

**Construction:** Join OA, OB, O'A, O'B.

**Proof:** In triangles OAO' and OBO',

OA = OB [Each radius]

O'A = O'B [Each radius]

OO' = OO' [Common]

$\therefore$ $\Delta$OAO' $\cong$ $\Delta$OBO' [By SSS congruency]

$\Rightarrow$ $\angle$AOO' = $\angle$BOO' [By CPCT]

$\Rightarrow$ $\angle$AOM = $\angle$BOM

Now in $\Delta$AOB, OA = OB

And $\angle$AOB = $\angle$OBA [Proved earlier]

Also $\angle$AOM = $\angle$BOM

$\therefore$ Remaining $\angle$AMO = $\angle$BMO

$\Rightarrow$ $\angle$AMO = $\angle$BMO = $90^\circ$ [Linear pair]

$\Rightarrow$ OM $\perp$ AB

$\Rightarrow$ OO' $\perp$ AB

Since OM $\perp$ AB

$\therefore$ M is the mid-point of AB.

Hence OO' is the perpendicular bisector of AB.

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