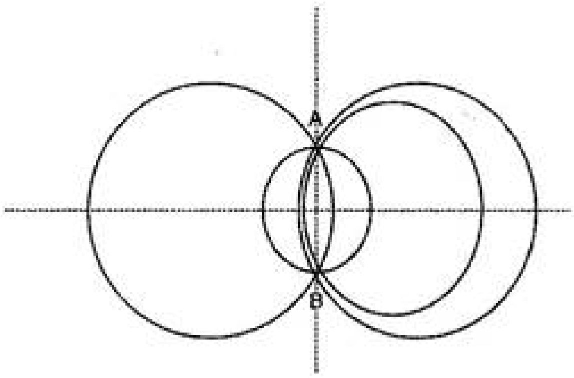
NCERT solutions for class 9 maths circles Ex 10.3

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.

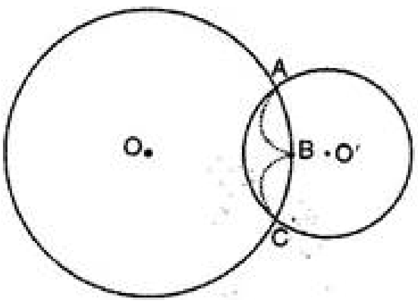
Then A, B and C are non-collinear points.

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.

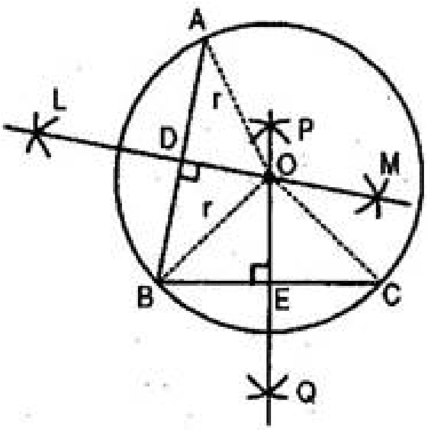
(b) Join AB and BC.

(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

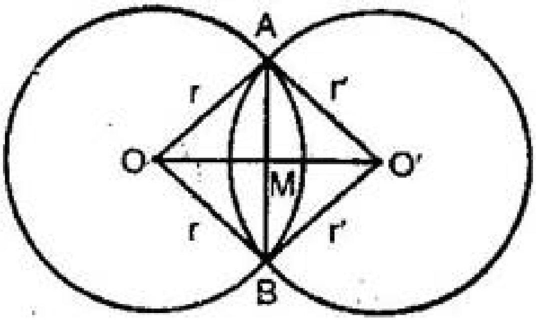
OA = OB = OC = r (say)

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]

$\therefore$ ΔOAO' $\cong$ ΔOBO' [By SSS congruency]

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

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

Now in ΔAOB, 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° [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 **********