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Maths Mistress
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Exercise - 10.3

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

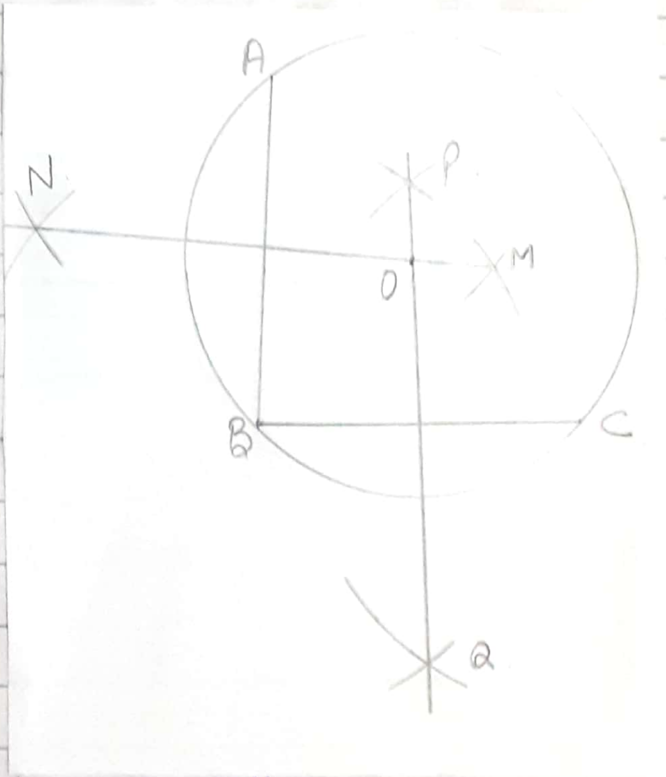
Sol:-

In each pair either 0 or 1 or 2 points are common.
The maximum number of common points is 2.

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

Steps of construction:-

1. Take any 3 points A, B and C lies on the circle.
2. Join AB and BC.
3. Draw the perpendicular bisector of AB and name it as MN.
4. Draw the perpendicular bisector of BC and name it as PQ.
5. Let 'O' be the point where perpendicular bisectors PQ and MN ~~bis~~ intersects each other.



Here, O is the centre of the circle.

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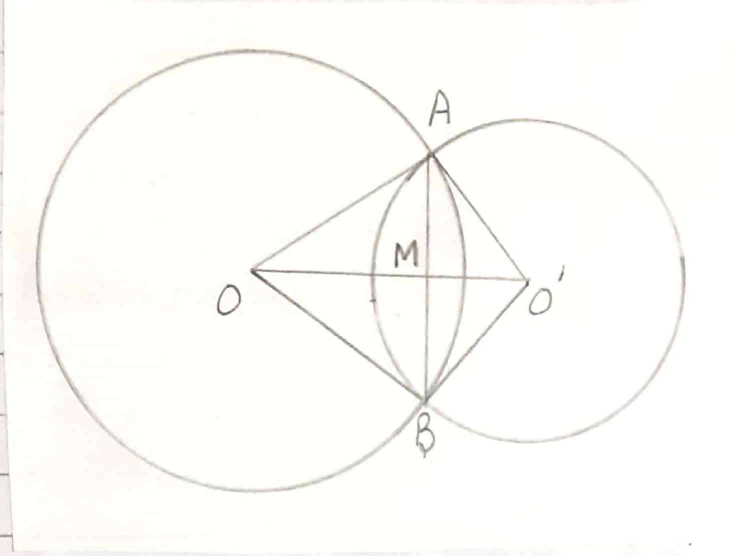
3. If two circles intersect at two points, prove that their centres lies on the perpendicular bisector of the common chord.

Sol.



We have two circles with centre O and O' intersecting at A and B. Join OA, OB, O'A and O'B.

Now, In $\Delta OAO'$ and $\Delta OBO'$

$OA = OB$ (radius of same circle)

$O'A = O'B$ (radius of same circle)

$OO' = OO'$ (common)

$\therefore \Delta OAO' \cong \Delta OBO'$ (by SSS congruence Rule)

$\therefore \angle AOO' = \angle BOO'$ (by c.p.c.t) — ①

Let AB and OO' intersect at point M.

In ΔAOM and ΔBOM

$OA = OB$

$\angle AOM = \angle BOM$ (using ①)

$OM = OM$ (Common)

$\therefore \Delta AOM \cong \Delta BOM$ (by SAS congruence rule)

$\therefore AM = BM$ (by c.p.c.t) — ②

~~Now~~ and $\angle AMO = \angle BMO$ (by c.p.c.t)

Now $\angle AMO + \angle BMO = 180^\circ$ (Linear Pair)

$\angle AMO + \angle AMO = 180^\circ$

$2\angle AMO = 180^\circ$

$\angle AMO = \frac{180^\circ}{2} = 90^\circ$.

Now $AM = BM$ and $\angle AMO = \angle BMO = 90^\circ$.

$\therefore$ centres O and O' lies on the perpendicular bisector of the common chord.

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