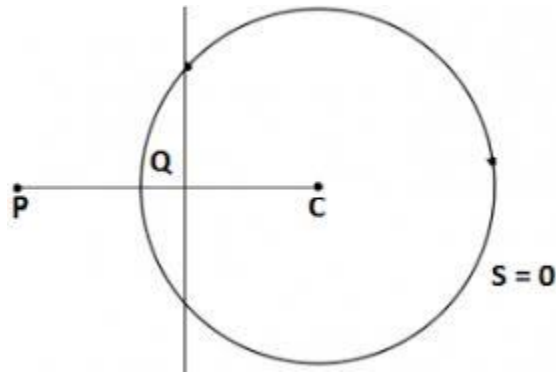
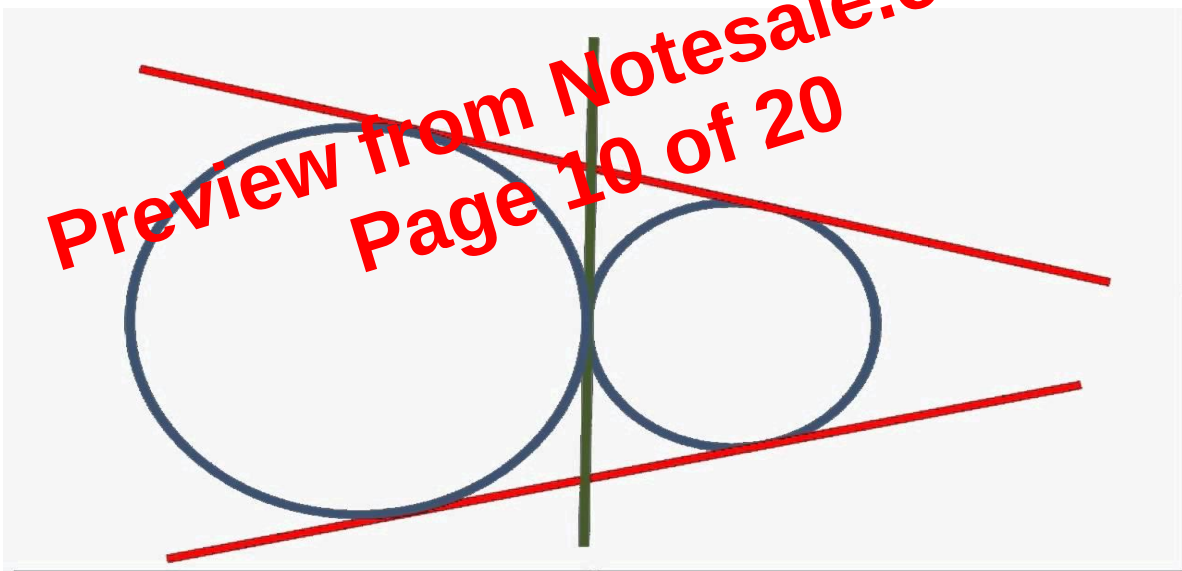




58. If $P(x_1, y_1)$ is the mid point of a chord AB (other than the diameter) of the circle $S = 0$ then the equation of secant $\overleftrightarrow{AB}$ is $S_1 = S_{11}$.

59. Common tangent of a circles :

A straight line L is said to be a common tangents to the circles $S = 0$ and $S' = 0$ if it is tangent to both $S = 0$ and $S' = 0$.



60. Touch each other of two circles :

Two circles are said to be touching each other if they have only one common tangent.

MODEL – 4

11. Show that the circles $x^2 + y^2 - 6x - 2y + 1 = 0$, $x^2 + y^2 + 2x - 8y + 13 = 0$ touch each other. Find the point of contact and the equation of common tangent at their point of contact.

12. Show that the circles $x^2 + y^2 - 6x - 9y + 13 = 0$, $x^2 + y^2 - 2x - 16y = 0$ touch each other. Find the point of contact and the equation of common tangent at their point of contact.

13. Show that the circles $x^2 + y^2 - 4x - 6y - 12 = 0$, $x^2 + y^2 + 6x + 18y + 26 = 0$ touch each other. Find the point of contact and common tangent at this point of contact.

14. Show that the circles $x^2 + y^2 - 4x - 6y - 12 = 0$, $5(x^2 + y^2) - 8x - 14y - 32 = 0$ touch each other. Find the point of contact.

MODEL – 5

15. Find the direct common tangents of the circles $x^2 + y^2 + 22x - 4y - 100 = 0$ and $x^2 + y^2 - 12x + 4y + 100 = 0$.

16. Find the transverse common tangents of the circles $x^2 + y^2 - 4x - 10y + 28 = 0$ and $x^2 + y^2 + 4x - 6y + 4 = 0$.

MODEL – 6

17. The combined equation of the pair of tangents drawn from an external point $P(x_1, y_1)$ to the circle $S = 0$ is $SS_{11} = S_1^2$.

18. Find the equations of circles which touch $2x - 3y + 1 = 0$ at $(1, 1)$ and having radius $\sqrt{13}$.

19. Find the equation of circle which touch the circle $x^2 + y^2 - 2x - 4y - 20 = 0$ externally at $(5, 5)$ with radius 5.

20. Find the equation of circle which touch the circle $x^2 + y^2 - 4x + 6y - 12 = 0$ internally at $(-1, 1)$ with radius 2.

- 13.** Show that $x + y + 1 = 0$ touches the circle $x^2 + y^2 - 3x + 7y + 14 = 0$ and find its point of contact .
- 14.** Find the equation of the circle with centre $(2, 3)$ and touching the line $3x - 4y + 1 = 0$.
- 15.** Find the equation of the circle with centre $(-2, 3)$ cutting a chord length 2 units on $3x + 4y + 4 = 0$.
- 16.** Find equations of tangents to the circle $x^2 + y^2 - 4x + 6y - 12 = 0$ which are parallel to $x + y - 8 = 0$.
(Do the problem taking the line $x + 2y - 8 = 0$ instead of $x + y - 8 = 0$)
- 17.** Find equations of tangents to the circle $x^2 + y^2 + 2x - 2y - 3 = 0$ which are parallel to $3x - y + 4 = 0$.
- 18.** Find the equation of tangent and normal at $(3, 2)$ of the circle $x^2 + y^2 - x - 3y - 4 = 0$.
- 19.** Find the equation of tangent and normal at $(1, 1)$ of the circle $2x^2 + 2y^2 - 2x - 5y + 3 = 0$.
- 20.** Find the equations of tangents to $x^2 + y^2 - 2x + 4y = 0$ at $(3, -1)$. Also find the equation of tangent Parallel to it .
-  Find the equation circle whose centre lie on the X – axis and passing through $(-2, 3)$ and $(4, 5)$.
AP March 2015

MODEL – 6

- 21.** If the abscissae of points A, B are the roots of the equation $x^2 + 2ax - b^2 = 0$ and ordinates of A, B are roots of $y^2 + 2py - q^2 = 0$ then find the equation of a circle for which $\overline{AB}$ is a diameter .
- 22.** Show that $A(-3, 0)$ lies on the circle $x^2 + y^2 + 8x + 12y + 15 = 0$.and find the other end of diameter through A.
- 23.** Show that $A(3, -1)$ lies on the circle $x^2 + y^2 - 2x + 4y = 0$.Also find the other end of diameter through A.
- 24.** Prove that the tangent at $(3, -2)$ of the circle $x^2 + y^2 = 13$ touches the circle $x^2 + y^2 + 2x - 10y - 26 = 0$ and Find its point of contact .
-  Show that the tangent at $(-1, 2)$ of the circle $x^2 + y^2 - 4x - 8y + 7 = 0$ touches the circle $x^2 + y^2 + 4x + 6y = 0$.also find its point of contact . BOARD MODEL PAPER
- 25.** Find the mid point of the chord intercepted by $x^2 + y^2 - 2x - 10y + 1 = 0$ on the line $x - 2y + 7 = 0$.
- 26.** Find the inverse point of $(-2, 3)$ with respect to the circle $x^2 + y^2 - 4x - 6y + 9 = 0$.