Equations of circle, Geometrical problems regarding circle

1. A square is inscribed in the circle , whose sides are parallel to the coordinate axes. One vertex of the square is **[IIT 1980; DCE 2001]**

(a) (b)

(c) (d) None of these

2. If the line is a diameter of the circle , then **[MP PET 1991]**

(a) 3 (b) – 5

(c) –1 (d) 5

3. For all values of , the locus of the point of intersection of the lines and is

(a) An ellipse (b) A circle

(c) A parabola (d) A hyperbola

4. If a circle whose centre is (1, –3) touches the line , then the radius of the circle is

(a) 2 (b) 4

(c) (d)

5. If the circle touches x-axis, then

(a) (b)

(c) (d)

6. The equation of the circle which touches both the axes and whose radius is a, is **[MP PET 1984]**

(a)

(b)

(c)

(d)

7. The area of the circle whose centre is at (1, 2) and which passes through the point (4, 6) is **[MNR 1982; IIT 1980; Karnataka CET 1999; MP PET 2002; DCE 2000; Pb. CET 2002]**

(a) (b)

(c) (d) None of these

8. The centres of the circles , and are **[MP PET 1986]**

(a) Same (b) Collinear

(c) Non-collinear (d) None of these

9. If a circle passes through the point (0, 0), (a, 0), (0, b), then its centre is **[MNR 1975]**

(a) (b)

(c) (d)

10. The equation of the circle whose centre is (1, –3) and which touches the line is

(a)

(b)

(c)

(d) None of these

11. The circle touches **[MP PET 1988]**

(a) x-axis (b) y-axis

(c) x-axis and y-axis (d) None of these

12. The equation of the circle which touches both axes and whose centre is is **[MP PET 1988]**

(a)

(b)

(c)

(d)

13. The equation of the circle whose radius is 5 and which touches the circle externally at the point (5, 5), is **[Pb. CET 2003; IIT 1979]**

(a)

(b)

(c)

(d)

14. The lines and are the diameters of a circle of area 154 square units. The equation of the circle is **[IIT 1989; AIEEE 2003; Kerala (Engg.) 2005]**

(a) (b)

(c) (d)

15. A circle touches the y-axis at the point (0, 4) and cuts the x-axis in a chord of length 6 units. The radius of the circle is **[MP PET 1992]**

(a) 3 (b) 4

(c) 5 (d) 6

16. The number of circle having radius 5 and passing through the points (– 2, 0) and (4, 0) is
(a) One (b) Two
(c) Four (d) Infinite

17. The equation of the circle which touches x-axis and whose centre is (1, 2), is **[MP PET 1984]**
(a)
(b)
(c)
(d)

18. The locus of the centre of the circle which cuts off intercepts of length and from x-axis and y-axis respectively, is
(a) (b)
(c) (d)

19. If the lines and are tangents to a circle, then the radius of the circle is **[IIT 1984; MP PET 1994, 2002; RPET 1995, 97; Kurukshetra CEE 1998]**
(a) 3/2 (b) 3/4
(c) 1/10 (d) 1/20

20. If the radius of the circle be 11, then **[MP PET 1987]**
(a) 347 (b) 4
(c) (d) 49

21. Centre of circle is
(a) (b)
(c) (d)

22. ABC is a triangle in which angle C is a right angle. If the coordinates of A and B be (–3, 4) and (3, –4) respectively, then the equation of the circumcircle of triangle ABC is
(a)
(b)
(c)
(d) None of these

23. The equation of the circle in the first quadrant touching each coordinate axis at a distance of one unit from the origin is **[RPET 1991; MP PET 1987, 89]**
(a)
(b)
(c)
(d) None of these

24. The number of circles touching the line and the y-axis is
(a) Zero (b) One
(c) Two (d) Infinite

25. The equation of the circle passing through the point and touching the line at the point (3, 0), is
(a)
(b)
(c)
(d) None of these

26. If the vertices of a triangle be , and (5, 2), then the equation of its circumcircle is
(a)
(b)
(c)
(d) None of these

27. The equation of a circle which touches both axes and the line and whose centre lies in the third quadrant is **[MP PET 1986]**
(a)
(b)
(c)
(d)

28. If one end of a diameter of the circle be (3, 4), then the other end is **[MP PET 1986; BIT Ranchi 1991]**
(a) (0, 0) (b) (1, 1)
(c) (1, 2) (d) (2, 1)

29. If the equation represents a circle, then the values of p and q are
(a) 3, 1 (b) 2, 2
(c) 3, 2 (d) 3, 4

30. The equation of the circle passing through the origin and cutting intercepts of length 3 and 4 units from the positive axes, is
(a)
(b)
(c)
(d)

31. Circle touches
(a) y-axis at the origin (b) x-axis at the origin
(c) x-axis at the point (3, 0) (d) The line

32. The circle represented by the equation will be a point circle, if
(a) (b)
(c) (d) None of these

33. The equation of the circle having centre and passing through the point of intersection of lines , is **[MP PET 1990]**

(a)

(b)

(c)

(d)

34. For the circle , which of the following statements is true

(a) Circle passes through the point

(b) Circle touches x-axis

(c) Circle touches y-axis

(d) None of these

35. Equation of the circle which touches the lines and is **[MP PET 1991]**

(a)

(b)

(c)

(d)

36. For the line and the circle , which of the following statements is true

(a) Line is a tangent to the circle

(b) Line is a chord of the circle

(c) Line is a diameter of the circle

(d) None of these

37. The locus of the centre of the circle which cuts a chord of length $2a$ from the positive x-axis and passes through a point on positive y-axis distant b from the origin is

(a) (b)

(c) (d)

38. The equation of circle passing through (4, 5) and having the centre at (2, 2), is **[MNR 1986; MP PET 1984]**

(a)

(b)

(c)

(d)

39. A circle touches x-axis and cuts off a chord of length $2l$ from y-axis. The locus of the centre of the circle is

(a) A straight line (b) A circle

(c) An ellipse (d) A hyperbola

40. Radius of circle is

(a) 3 (b) 4

(c) 5/2 (d) 7/2

41. The equation of the circle which passes through the points (2, 3) and (4, 5) and the centre lies on the straight line , is **[RPET 1985; MP PET 1989]**

(a)

(b)

(c)

(d)

42. The equation of the circle with centre at (1, –2) and passing through the centre of the given circle , is

(a)

(b)

(c)

(d)

43. The equation of the circle concentric with the circle and passing through the centre of the circle is

(a)

(b)

(c)

(d)

44. The equation of the circle passing through the points (0, 0), (0, b) and (a, b) is **[AMU 1978]**

(a) (b)

(c) (d)

45. The equation will represent a circle, if **[MNR 1979; MP PET 1988; RPET 1997, 2003]**

(a) and (b) and

(c) and (d) and

46. The equations of the circles touching both the axes and passing through the point (1, 2) are

(a)

(b)

(c)

(d) None of these

47. Which of the following line is a diameter of the circle

(a) (b)

(c) (d)

48. A circle is concentric with the circle and has area double of its area. The equation of the circle is

(a)

(b)

(c)

(d) None of these

49. If the radius of the circle be r, then it will touch both the axes, if

(a) (b)

(c) (d) and

50. The equation of the circle with centre on the x-axis, radius 4 and passing through the origin, is

(a) (b)

(c) (d)

51. The equation of the circle passing through the point (2, 1) and touching y-axis at the origin is

(a) (b)

(c) (d) None of these

52. The equation of the circle which passes through the origin and cuts off intercepts of 2 units length from negative coordinate axes, is

(a) (b)

(c) (d)

53. For the circle , which of the following relations is true

(a) Centre lies on x-axis

(b) Centre lies on y-axis

(c) Centre is at origin

(d) Circle passes through origin

54. The equation of the circle with centre on x-axis, radius 5 and passing through the point (2, 3), is

(a) (b)

(c) (d)

55. The equation of the circle which touches x-axis at (3, 0) and passes through (1, 4) is given by **[MP PET 1993]**

(a)

(b)

(c)

(d)

56. If the lines and be diameters of the circle whose diameter is 20, then the equation of the circle is

(a)

(b)

(c)

(d)

57. The number of circles touching the lines , and is

(a) One (b) Two

(c) Four (d) Infinite

58. The equation of the circle whose diameters have the end points $(a, 0)$ $(0, b)$ is given by **[MP PET 1993]**

(a) (b)

(c) (d)

59. The centre and radius of the circle are **[MP PET 1984, 87]**

(a) and (b) and

(c) and (d) and

60. Centre of the circle is **[MP PET 1988]**

(a) (3, 4) (b)

(c) (4, 3) (d)

61. The equation of the circle touching and is **[UPSEAT 2004]**

(a)

(b)

(c)

(d)

62. The equation denotes **[MP PET 1984]**

(a) A point (b) A circle

(c) x-axis (d) y-axis

63. represents a circle through the origin, if **[MP PET 1984]**

(a) (b)

(c) (d)

64. Equation of a circle whose centre is origin and radius is equal to the distance between the lines and is **[MP PET 1984]**

(a) (b)

(c) (d)

65. A circle touches the axes at the points (3, 0) and (0, –3). The centre of the circle is **[MP PET 1992]**

(a) (3, –3) (b) (0, 0)

(c) (–3, 0) (d) (6, –6)

66. If the centre of a circle is (2, 3) and a tangent is , then the equation of this circle is **[RPET 1985, 89]**

(a) (b)

(c) (d)

67. A circle which passes through origin and cuts intercepts on axes a and b, the equation of circle is **[RPET 1991]**

(a) (b)

(c) (d)

68. A circle passing through is concentric to the circle , then the value of c will be **[RPET 1984, 86]**

(a) – 4 (b) 4

(c) 0 (d) 1

69. If the equation represents a circle with x-axis as a diameter and radius a, then

(a) (b)

(c) (d) None of these

70. The equation of a diameter of circle passing through origin is **[RPET 1991; IIT 1989; MP PET 2002]**

(a) (b)

(c) (d)

71. The radius of a circle which touches y-axis at (0,3) and cuts intercept of 8 units with x-axis, is **[IIT 1972]**

(a) 3 (b) 2

(c) 5 (d) 8

72. A point P moves in such a way that the ratio of its distance from two coplanar points is always a fixed number . Then its locus is **[IIT 1982]**

(a) Straight line (b) Circle

(c) Parabola (d) A pair of straight lines

73. The equation of the circumcircle of the triangle formed by the lines and , is **[EAMCET 1982]**

(a) (b)

(c) (d)

74. The equation represents **[Roorkee 1990]**

(a) Circle

(b) Pair of coincident straight lines

(c) Pair of concurrent straight lines

(d) Point

75. The equation of a circle with centre and touching the circle , is

(a)

(b)

(c)

(d) None of these

76. The equation of the circle concentric with the circle and touching y-axis, is

(a)

(b)

(c)

(d) None of these

77. Locus of the centre of the circle touching both the co-ordinates axes is

(a)

(b) a non-zero constant

(c)

(d) a non-zero constant

78. A line meets the coordinate axes in A and B. A circle is circumscribed about the triangle OAB. If m and n are the distance of the tangents to the circle at the points A and B respectively from the origin, the diameter of the circle is

(a) (b)

(c) (d)

79. Radius of the circle , is **[MNR 1974]**

(a) 1 (b) 3

(c) (d)

80. If the lines and cuts the axes at con-cyclic points, then

(a) (b)

(c) (d)

81. The locus of a point which moves such that the sum of the squares of its distances from the three vertices of a triangle is constant, is a circle whose centre is at the

(a) Incentre of the triangle

(b) Centroid of the triangle

(c) Orthocentre of the triangle

(d) None of these

82. Locus of the points from which perpendicular tangent can be drawn to the circle , is

(a) A circle passing through origin

(b) A circle of radius $2a$

(c) A concentric circle of radius

(d) None of these

83. The locus of the centre of a circle which always passes through the fixed points $(a, 0)$ and , is

(a) (b)

(c) (d)

84. The equation to a circle whose centre lies at the point (–2, 1) and which touches the line at (4, 3), is

(a)

(b)

(c)

(d) None of these

85. The equation of a circle passing through the point (4, 5) and having the centre at (2, 2) is **[UPSEAT 2000]**

(a)

(b)

(c)

(d)

86. The locus of the centre of a circle which touches externally the circle and also touches the y-axis, is given by the equation **[IIT 1993; DCE 2000]**

(a) (b)

(c) (d)

87. The area of a circle whose centre is (h, k) and radius a is **[MP PET 1994]**

(a) (b)

(c) (d) None of these

88. If the equation represents a circle, then **[MP PET 1994]**

(a) 3/4 (b) 1

(c) 4/3 (d) 12

89. A circle has radius 3 units and its centre lies on the line . Then the equation of this circle if it passes through point (7, 3), is **[Roorkee 1988]**

(a)

(b)

(c)

(d) None of these

90. The equation of circle whose diameter is the line joining the points (–4, 3) and (12, –1) is **[IIT 1971; RPET 1984, 87, 89; MP PET 1984; Roorkee 1969; AMU 1979]**

(a)

(b)

(c)

(d)

91. The equation of the circle which passes through the points and and centre lies on the line , is **[Roorkee 1971]**

(a)

(b)

(c)

(d) None of these

92. The locus of the centre of a circle of radius 2 which rolls on the outside of circle , is

(a)

(b)

(c)

(d) None of these

93. Area of the circle in which a chord of length makes an angle at the centre is

(a) (b)

(c) (d)

94. The circle passing through point of intersection of the circle and the line is **[RPET 1995]**

(a) (b)

(c) (d)

(e) All of these

95. If the coordinates of one end of the diameter of the circle are (–3, 2), then the coordinates of other end are **[Roorkee 1995]**

(a) (5, 3) (b) (6, 2)

(c) (1, –8) (d) (11, 2)

96. For to represent a circle, one must have

(a) (b)

(c) (d)

97. A line is drawn through a fixed point to cut the circle at A and B. Then is equal to

(a) (b)

(c) (d) None of these

98. The centre of the circle , , is **[MP PET 1995]**

(a) (1, –3) (b) (–1, 3)

(c) (1, 3) (d) None of these

99. If $(x, 3)$ and (3, 5) are the extremities of a diameter of a circle with centre at , then the value of x and y are

(a) (b)

(c) (d) None of these

100. Circles are drawn through the point (2, 0) to cut intercept of length 5 *units* on the x-axis. If their centres lie in the first quadrant, then their equation is

(a)

(b)

(c)

(d)

101. Equations to the circles which touch the lines , and pass through (2, 3) are **[EAMCET 1989]**

(a)

(b)

(c) Both (a) and (b)

(d) None of these

102. The equation of the circle in the first quadrant which touches each axis at a distance 5 from the origin is **[MP PET 1997]**

(a)

(b)

(c)

(d)

103. The equation of the circle which passes through (1, 0) and (0, 1) and has its radius as small as possible, is

(a)

(b)

(c)

(d)

104. The equation of the circumcircle of the triangle formed by the lines is **[MP PET 2004]**

(a)

(b)

(c)

(d)

105. If is the centre of a circle passing through the origin, then its equation is **[MP PET 1999]**

(a)

(b)

(c)

(d)

106. The equation represents **[Roorkee 1999]**

(a) A pair of straight lines (b) A circle

(c) An ellipse (d) None of these

107. The equation of the circle whose diameter lies on and which passes through (4,6) is **[Kurukshetra CEE 1998]**

(a)

(b)

(c)

(d)

108. The area of the curve is **[MP PET 1996]**

(a) (b)

(c) (d)

109. Radius of the circle is

(a) 2 (b)

(c) 3 (d)

110. The equation of circle whose centre lies on and and has an area 154 square units is **[DCE 2001]**

(a)

(b)

(c)

(d) None of these

111. The circle touches **[Karnataka CET 1999, 2004; Pb. CET 2000]**

(a) x-axis only (b) y- axis only

(c) Both x and y- axis (d) Does not touch any axis

112. The equation of circle with centre (1, 2) and tangent is **[MP PET 2001]**

(a)

(b)

(c)

(d)

113. The equation of the circle passing through the point (–2, 4) and through the points of intersection of the circle and the line , is **[RPET 1996]**

(a)

(b)

(c)

(d)

114. The equation of the circle of radius 5 and touching the coordinate axes in third quadrant is **[EAMCET 2002]**

(a) (b)

(c) (d)

115. The circle cuts x-axis at

[Karnataka CET 2001; Pb. CET 2002]

(a) (b)

(c) (d)

116. If , then the equation will represent **[MP PET 2003]**

(a) A circle of radius g (b) A circle of radius f

(c) A circle of diameter (d) A circle of radius 0

117. The centre of a circle is $(2, -3)$ and the circumference is . Then the equation of the circle is

[Kerala (Engg.) 2002]

(a)

(b)

(c)

(d)

118. A variable circle passes through the fixed point (2,0) and touches the y-axis . Then the locus of its centre is

[EAMCET 2002]

(a) A circle (b) An Ellipse

(c) A hyperbola (d) A parabola

119. The limit of the perimeter of the regular n-gons inscribed in a circle of radius R as is **[MP PET 2003]**

(a) (b)

(c) (d)

120. The centre of circle inscribed in square formed by the lines and , is

[IIT Screening 2003]

(a) (4, 7) (b) (7, 4)

(c) (9, 4) (d) (4, 9)

121. For what value of k, the points (0, 0), (1, 3), (2, 4) and $(k, 3)$ are con-cyclic **[RPET 1997]**

(a) 2 (b) 1

(c) 4 (d) 5

122. The four distinct points (0, 0),(2, 0), (0, –2) and $(k,-2)$are con-cyclic, if k = **[EAMCET 2002]**

(a) –2 (b) 2

(c) 1 (d) 0

123. Through which of the following pairs of points does the circle pass **[MP PET 1983]**

(a) (–1, 0), (b)

(c) , (d)

124. The radius of the circle passing through the point (6, 2) and two of whose diameters are and is

[Karnataka CET 2004]

(a) 4 (b) 6

(c) 20 (d)

125. If the lines and lie along diameters of a circle of circumference , then the equation of the circle is **[AIEEE 2004]**

(a)

(b)

(c)

(d)

126. The equation of a circle touching the axes of coordinates and the line can be

(a) ,

where

(b) ,

where

(c) ,

where

(d)

where

(e) All of these

127. If a circle and a square have the same perimeter, then

[Pb. CET 2001]

(a) Their area are equal

(b) Area of circle is larger

(c) Area of square is larger

(d) None of these

128. The length of intercept, the circle makes on the x-axis is

[Pb. CET 2001]

(a) 2 (b) 4

(c) 6 (d) 8

129. The equation to the circle with centre (2, 1) and touching the line is **[Karnataka CET 2005]**

(a)

(b)

(c)

(d)

130. The centre of the circle , is

[Karnataka CET 2005]

(a) (3, 3) (b)

(c) (d)

131. The radius of the circle is **[Karnataka CET 2005]**

(a) (b)

(c) (d) 0

132. Let and are two points such that their abscissa and are the roots of the equation while the ordinates and are the roots of the equation . The centre of the circle with PQ as diameter is **[Orissa JEE 2005]**

(a) (b)

(c) (d)

133. Four distinct points and lie on a circle for **[DCE 2005]**

(a) (b)

(c) (d) For two values of k

134. If one end of the diameter is (1, 1) and other end lies on the line , then locus of centre of circle is **[AMU 2005]**

(a) (b)

(c) (d) None of these

135. A circle is drawn to cut a chord of length $2a$ units along X-axis and to touch the Y-axis. The locus of the centre of the circle is **[Kerala (Engg.) 2005]**

(a) (b)

(c) (d)

(e)

Tangent and normal to a circle

1. If the length of tangent drawn from the point (5, 3) to the circle be 7, then k =

(a) 4 (b) – 4

(c) – 6 (d) 13/2

2. The line will be a tangent to the circle iff **[MNR 1974; AMU 1981]**

(a) (b)

(c) (d)

3. The angle between the two tangents from the origin to the circle is **[MNR 1990; RPET 1997; DCE 2000]**

(a) 0 (b)

(c) (d)

4. A pair of tangents are drawn from the origin to the circle . The equation of the pair of tangents is **[MP PET 1990]**

(a) (b)

(c) (d)

5. If OA and OB be the tangents to the circle drawn from the origin O, then AB =

(a) 11 (b)

(c) (d) None of these

6. Equation of the pair of tangents drawn from the origin to the circle is

(a) (b)

(c) (d)

7. If the line be a tangent to the circle , then the point of contact is

(a) (b)

(c) (d)

8. The locus of the centre of a circle which passes through the point $(a, 0)$ and touches the line , is

(a) Circle (b) Ellipse

(c) Parabola (d) Hyperbola

9. A point inside the circle is **[MP PET 1988]**

(a) (– 1, 3) (b) (– 2, 1)

(c) (2, 1) (d) (– 3, 2)