Conic section

Episode:43

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1. A circle $x^2 + y^2 + 2gx + 2fy + c = 0$ is said to be imaginary circle if
   a) $g^2 + f^2 = c$ b) $g^2 + f^2 > c$ c) $g^2 + f^2 < c$ d) $g = f$

   Ans: c

2. If (1,-3) is the centre of the circle $x^2 + y^2 + ax + by + 9 = 0$, then the radius of the circle is
   a) 2   b) 3   c) 1   d) 4

   Ans: c

3. If the circles $3x^2 + 3y^2 + 3x + 9y - k = 0$ & $4x^2 + 4y^2 - 4x + 2y + k = 0$ are orthogonal, then k =
   a) 3   b) 2   c) 0   d) -3

   Ans: d

4. If the circles $x^2 + y^2 + 2ax + c = 0$ & $x^2 + y^2 + 2by + c = 0$ touch each other then
   a) $\dfrac{1}{a^2} + \dfrac{1}{b^2} = \dfrac{1}{c}$ b) $a^2 + b^2 = c$ c) $a = b$ d) $a - b = c$

   Ans: a

5. The length of the tangent to the circle $x^2 + y^2 - 2x - y - 7 = 0$ from (-1 , -3) is
   a) 8   b) $2\sqrt{2}$ c) 6   d) 2

   Ans: b

6. The equation of the circle with centre (2,-3) and touching the y-axis is
   a) $x^2 + y^2 + 4xy + 6y + 9 = 0$ b) $x^2 + y^2 + 4xy - 6y + 9 = 0$
   c) $x^2 + y^2 - 4xy + 6y + 9 = 0$ d) $x^2 + y^2 - 4x + 6y + 9 = 0$

   Ans: d

7. If the circle $x^2 + y^2 = 25$ touches the line $6x - k\,y + 4 = 0$, then k =
   a) 1   b) 3   c) 4   d) does not exist

   Ans: c

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8. If the distance between the centers of two circle of radii $2\sec^2 50°$ and $2\tan^2 50°$ is 2 , then they
   a) touch externally   b) touch internally   c) do not touch   d) do not intersect

   Ans: b

9. The equation of the tangent to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ at the origin is
   a) x = 0   b) y = 0   c) fx + gy = 0   d) gx + fy = 0

   Ans: d

10. The given two circles $x^2 + y^2 - 2x + 6y + 6 = 0$ and $x^2 + y^2 - 5x + 6y + 15 = 0$ are
    a) Concentric circle   b) intersecting type of circles
    c) Touch each other externally   d) touch each other internally

    Ans: d

11. $x^2 + y^2 + 4x + 2y - 1 = 0$ is the given circle . Consider two points A(1 , -1) , B(2 , 0) which of
    the following statement is true.
    a) both the points are inside the circle   b) both the points are outside the circle
    c) A is inside and B is outside   d) A is outside and B is inside the circle

    Ans: b

12. The equation of the circle through origin and cut intercepts 3 and 5 on the co-ordinate axes
    a) $x^2 + y^2 = 5$ b) $x^2 + y^2 - 3x - 5y = 0$ c) $x^2 + y^2 - 3x + 5y + 2 = 0$ d) $x^2 + y^2 - x + 6y + = 0$

    Ans: b

13. Find the centre of the circle $5x^2 + 5y^2 - 6x + 8y - 75 = 0$
    a) (3/5 , - 4/5)   b) (-3/5 , - 4/5)   c) (-3/5 , 4/5)   d) (3/5 , 4/5)

    Ans: a

14. The value of k for which the line 2x - 3y + k = 0 is a diameter of the circle $x^2 + y^2 - 6x + 8y + 11 = 0$.
    a) 0   b) -2   c) 12   d) -18

    Ans: d

15. One end of the diameter of the circle $x^2 + y^2 - 2x + 6y + 1 = 0$ is (-4,5). Then other end is
    a) (6 , -11)   b) (-6 , -11)   c) (6 , 11)   d) (-6 , 11)

    Ans: a

16. The length of the tangent from (1,-2) to the circle $x^2 + y^2 + 2x - 3y + 4 = 0$ is

   a) 17   b) 3   c) 15   d) 12

     Ans: a

17. Find the equation of the circle with the centre at (1,1) and passing through (4,5)

     a) $x^2 + y^2 - 2x - 3y + 1 = 0$ b) $x^2 + y^2 - 2x + 4 = 0$

     c) $x^2 + y^2 - 2x - 2y - 23 = 0$ d) $x^2 + y^2 - x + 6y + = 0$

     Ans: c

18. If AB is the distance between centers of two circles and r_1 and r_2 are radius of circles, If
    AB > r_1 + r_2 , then the number of common tangents

    a) 0   b) 2   c) 3   d) 4

     Ans: a

19. Equation of the tangent at (-2,1) on the circle $x^2 + y^2 - 2x + 3y - 12 = 0$ is

    a) 6x-5y-17=0   b) 6x + 5y – 17 = 0   c) 6x + 5y + 17 = 0   d) 6x - 5y + 17 = 0

     Ans: d

20. Equation of the circle having (5,0) and (0,5) as the ends of a diameter

    a) $x^2 + y^2 - 5x - 5y = 0$ b) $x^2 + y^2 + 5x + 5y = 0$

    c) $x^2 + y^2 - 10x - 10y = 0$ d) $x^2 + y^2 + 10x + 5y = 0$

     Ans: c

21. For which value of k the circles $2x^2 + 2y^2 - 3x + 6y + k = 0$ & $x^2 + y^2 - 4x + 10y + 16 = 0$ cut
    Orthogonally

    a) -2   b) 0   c) 4   d) -4

     Ans: c

22. The radius of the circle with the centre at (2,-3) and touching the line 2x - 5y + 26 = 0 is

    a) 1   b) 3   c) 5   d) $\dfrac{45}{\sqrt{29}}$

     Ans: d

23. If the line 3x - 4y – k = 0 touches the circle $x^2 + y^2 - 4x + 6y + 4 = 0$, then a value of k is

    a) 1   b) 2   c) 3   d) 4

     Ans: c

24. The power of the point (1,-1) w.r.t. the circle $x^2 + y^2 + 4x + 2y - 1 = 0$ is
   a) 3   b) 5   c) 3   d) 5

   Ans: a

25. The equation $x^2 + y^2 - 4x + 6y + 13 = 0$ represents
   a) an imaginary circle   b) a point circle   c) a circle of radius unity   d) not a circle

   Ans: b

26. The equation of the chord of the circle $x^2 + y^2 - 4x - 2y - 2 = 0$ which is bisected at the point
   (2,3)
   a) y + x = 1   b) y = -3   c) y = 3   d) x + y = 0

   Ans: c

27. The area of the circle in sq.units, centre (1,2) and passing through (4, 6) is
   a)$5f$ b) $10f$ c) $25f$ d) $20f$

   Ans: c

28. A line cuts the circle in two real and distinct points if
   a) radius = length of tangent   b) radius of the circle > ⊥ length from centre to the line
   c) radius = length of perpendicular   d) none

   Ans: b

29. The circle $x^2 + y^2 + 2gx + 2fy + c = 0$ touches the x – axis if
   a) $f^2 = c$ b) $f^2 = g^2$ c) $g^2 = 0$ d) $g^2 = c$

   Ans: d

30. The circle $x^2 + y^2 + 2gx + 2fy + c = 0$ touches the both the co-ordinate axes is
   a) $f^2 = g^2$ b) $f^2 = g^2 = c$ c) $f^2 = c$ d) none

   Ans: b

PARABOLA

1. The equation to the tangent at the vertex of the parabola with vertex at the point (4,1) and focus (3,2) is
   a) x=0   b) y=0   c) x-y-3=0   d) x = 3

   Ans: c

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2. The vertex of the parabola, whose focus is (3,5) and the point of intersection of axis and directrix is (1,1).

a) (2,3)　　　　　　b) (2,-3)　　c) (-2,3)　　　　　d) (-2,-3)

Ans: a

3. The line px + qy + r = 0 will be tangent to the parabola y^2=4ax. If

a) pr = aq^2　　　b) pq = ar^2　　　c) pq = r　　d) None

Ans: a

4. If the vertex of a parabola be at origin and directrix be x + 5 = 0 , then its latus rectum is

a) 5　　　　　　b) 10　　　c) 20　　　　　　d) 40

Ans: c

5. The tangents at the ends of a focal chord of the parabola y^2 =4ax intersect on the line

a) y = a　　　b) y = -a　　c) x = a　　d) x = -a

Ans: d

6. The focus of a parabola is (3,3) and directrix is 3x – 4y -2 = 0. Then the latus rectum is

a) 2　　　　　　b) 3　　　　c) 4　　　d) 5

Ans: a

7. The ends of the latus rectum of a parabola are (-3, 6) and (8 , 6) then the focus is

a) (-3,8)　　　　b) (5,12)　　　c) (5/2 , 6)　　　　　d) (- 5/2 , - 6)

Ans: c

8. The equation of the tangent to the parabola y^2 = 5x perpendicular to 4x-y = 50 is

a) 3x+4y+20 = 0　b) x+4y+20 = 0　　c) x-4y-20 = 0　　d) x –y -2 = 0

Ans: b

9. If the tangent to the parabola y^2 =4x from a point p are at right angles the locus of p is

a) x+1 = 0　　b) 2x-1 = 0　　c) x-1=0　　d) 2x+1 = 0

Ans: a

10. The equation of the parabola whose vertex is (1,2) and focus (1,-1) is

a) x^2=4(y+2)　　b) $(x+1)^2$ = 4(y+2)　c) $(x+1)^2$=4(y-2)　d) $(x-1)^2$=4(y-2)

Ans: d

11. The parametric equations of the parabola $(y-2)^2$ = 4(x-1) are

a) x = 1-t^2,y=2+2　b) x =1+t^2,y=2+2t　c) x=1-t^2,y=2-2t　d) x = 1-t, y = 4t

Ans: b

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12. If t_1 and t_2 are the parameters of the end points of a focal chord of the parabola $y^2 = 4ax$ then
   a) $t_1 + t_2 = -1$ b) $t_1 + t_2 = 1$ c) $t_1 t_2 = -1$ d) $tt_2 = 1$

   Ans: c

13. The condition the the line $x/p + y/q = 1$ is a tangent to the parabola $y^2 = 4ax$ is
   a) $a + p^2$ b) $ap + q^2 = 0$ c) $a - q^2$ d) $1 + p = q$

   Ans: b

14. The line $y = mx + c$ is a tangent to the parabola $y^2 = 4a(x+a)$ then c is equal to
   a) a/m b) am c) $am + a/m$ d) am^2

   Ans: c

15. The equation of the normal to the parabola $y^2 = 16x$ at $(1,-4)$ is
   a) $x + y - 2 = 0$ b) $y = 0$ c) $x + 1 = 0$ d) $x - 2y - 9 = 0$

   Ans: d

16. The axis of the parabola $2x^2 + 5y - 3x + 4 = 0$ is
   a) $x = 2$ b) $y + 2 = 0$ c) $x - y = 0$ d) $x = 3$

   Ans: a

17. The vertex and focus of a parabola are at $(1,3)$ and $(5,3)$. Then its eccentricity is
   a) 2   b) 1   c) 1.5   d) 0

   Ans: b

18. The equation of the directrix of the parabola $x^2 - 8y = 0$ is
   a) $y - 2 = 0$ b) $x - 2 = 0$ c) $y + 2 = 0$ d) $x + 2 = 0$

   Ans: c

19. The focus of the parabola $y^2 + 2x = 0$ is
   a) $(-1/2, 0)$ b) $(3,0)$ c) $(0,3)$ d) $(-3,0)$

   Ans: a

20. A focal chord of the parabola $x^2 = 16y$ is
   a) $x + y + 4 = 0$ b) $x + 2y = 8$ c) $2x + y + 1 = 0$ d) $x - 2y = 8$

   Ans: b

21. The distance between the focus and the directrix of the parabola $(x-2)^2=-6(y+3)$ is
   a) 6   b) 12   c) 3/2   d) 3

Ans: d

22. The equation of the latus rectum of the parabola $(y-1)^2=4(x+1)$ is
   a) y=0   b) x=0   c) x=-1   d) y = 1

Ans: b

23. The equation of the axis of the parabola $(x + 2)^2 + 12(y-1) = 0$ is
   a) y-1=0   b) x-2=0   c) x+2=0   d) y = 1

Ans: c

24. The vertex of the parabola $x^2-4y-8x-4=0$ is at
   a) (4,-5)   b) (-4,5)   c) (-4,5)   d) (4,5)

Ans: a

25. The length of the latus rectum of the parabola $y^2-5x+2y+3=0$ is
   a) 2   b) 5   c) 5/2   d) 5/4

Ans: b

ELLIPSE

1. The coordinates of the center of the conic $25x^2+9y^2-150x-90y+225 = 0$
   a) (5,3)   b) (3,5)   c) (-3,5)   d) (3,-5)

Ans: b

2. If the major axis of an ellipse is 3 times its minor axis then its eccentricity is
   a) 2/3   b) 2/3   c) 2 2/3   d) ½

Ans: c

3. The centre of the ellipse $9x^2 + 5y^2 - 36x - 50y - 164 = 0$ is at
   a) (-2, 1)   b) (2,5)   c) (0,5)   d) (1,2)

Ans: b

4. The equation of the director circle of the ellipse $9x^2+25y^2=225$
   a) $x^2 + y^2 = 34$ b) $x^2 + y^2 = 43$ c) $x^2 + y^2 = 16$ d) $x^2 + y^2-x - 43=0$

Ans: a

5. The sum of the focal distances of the point (-3, 2) on the ellipse $\dfrac{x^2}{9} + \dfrac{y^2}{4} = 1$

   a) 4   b) 2/3   c) 6   d) 8

   Ans: c

6. The product of the perpendiculars from the foci on any tangent to $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$ is

   a) a^2 b) $a^2 - b^2$ c) b^2 d) a

   Ans: c

7. S and $S^|$ are the foci of an ellipse and P (4cos , sin) is a point on the ellipse then $S^|P + SP =$

   a) 6   b) 6sin   c) 8   d) 8cos

   Ans: c

8. Area of the ellipse $\dfrac{x^2}{25} + \dfrac{y^2}{9} = 1$ (in Square units)

   a) 150   b) 200   c) 400   d) $15f$

   Ans: d

9. The line $y = 2x + k$ touches the ellipse $4x^2 + y^2 = 8$, then the value of ' k' is

   a) ± 2 b) ± 23 c) ± 4 d) ± 22

   Ans: c

10. An ellipse has a minor axis of length 6 and the distance between foci is 8.It's equation is

   a) $\dfrac{x^2}{25} + \dfrac{y^2}{9} = 1$ b) $\dfrac{x^2}{9} + \dfrac{y^2}{25} = 1$ c) $\dfrac{x^2}{6} + \dfrac{y^2}{9} = 1$ d) $\dfrac{x^2}{6} - \dfrac{y^2}{9} = 1$

   Ans: a

11. The equation to the circle with major axis of the standard ellipse as the diameter and concentric
   With it is

   a) $x^2 + y^2 = b^2$ b) $x^2 + y^2 = a^2 + b^2$ c) $x^2 + y^2 = a^2$ d) $x^2 + y^2 = a^2 - b^2$

   Ans: c

12. The point of intersection of two perpendicular tangents to $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$ lies on

   a) $x^2 + y^2 = b^2$ b) $x^2 + y^2 = a^2 + b^2$ c) $x^2 + y^2 = a^2$ d) $x^2 + y^2 = a^2 - b^2$

   Ans: b

13. L.R of an ellipse is equal to half of its minor axis. Then the value of 'e' is

a) $3/2$ b) 2   c) $\dfrac{3}{2}$ d) 1/2

Ans: a

14. The points (5, 0) and (-5, 0) are the end points of major axis. If 3x-5y = 9 is a focal chord, then equation of ellipse is

a) $\dfrac{x^2}{25} + \dfrac{y^2}{16} = 1$ b) $\dfrac{x^2}{25} + \dfrac{y^2}{9} = 1$ c) $4x^2 + y^2 = 1$ d) $x^2 + 2y^2 = 1$

Ans: a

15. (2,4) and (10,10) are the ends of a latus rectum of an ellipse whose e = 1/2 then major axis is

a) 20/3   b) 40/3   c)25/3   d)none

Ans: b

16. If the minor axis of an ellipse subtends an angle 60° at the focus the e =

a) ½   b) 3   c) $3/2$ d) 2/3

Ans: c

17. The distance between the foci and directrices of the ellipse $9x^2 + 5y^2 = 45$

a) 4,8   b) 4,9   c) 3,9   d) 5,2 5

Ans: b

19. Any tangent to the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$ makes intercepts h and k on the co-ordinate axes. Then

a) $\dfrac{a^2}{k^2} + \dfrac{b^2}{h^2} = 1$ b) $\dfrac{a^2}{h^2} + \dfrac{b^2}{k^2} = 0$ c) $\dfrac{a^2}{h^2} + \dfrac{b^2}{k^2} = 1$ d) $\dfrac{a^2}{h} + \dfrac{b^2}{k} = 0$

Ans: c

20. The equation of the tangent to the ellipse $\dfrac{x^2}{12} + \dfrac{y^2}{6} = 1$ at (-2,2) is

a) x-2y+6=0   b) 2x+y+6=0   c) x+3y=0   d) x − y − 1 = 0

Ans: a

HYPERBOLA :

1. The angle between the asymptotes of the hyperbola $\dfrac{x^2}{4} - \dfrac{y^2}{12} = 1$ is

   a) 30°   b) 60°   c) 45°   d) 120^0

   Ans: d

2. Product of the perpendiculars drawn from any point on the hyperbola to its asymptotes is

   a) $\dfrac{a^2 b^2}{a^2 + b^2}$ b) $\dfrac{a^2}{a^2 + b^2}$ c) $\dfrac{b^2}{a^2 + b^2}$ d) none

   Ans: a

3. The eccentricity of rectangular hyperbola is   a) $\dfrac{1}{\sqrt{2}}$ b) $-\dfrac{1}{\sqrt{2}}$ c) $\dfrac{\sqrt{2}}{2}$ d) $\sqrt{2}$

   Ans: d

4. Eccentricity of hyperbola $9x^2 - 16y^2 = 144$ is

   a) 5/4   b) 4/5   c) 3/5   d) 4/3

   Ans: a

5. The distance between the foci of hyperbola is 16 and its eccentricity is 2, its equation is

   a) $x^2 - y^2 = 32$ b) $\dfrac{x^2}{4} - \dfrac{y^2}{9} = 1$ c) $2x^2 - 3y^2 = 7$ d) $\dfrac{x^2}{9} - \dfrac{y^2}{4} = 1$

   Ans: a

6. The length of the conjugate axis of hyperbola $49x^2 - 4y^2 = 196$ is

   a) 4   b) 7   c) 2   d) 14

   Ans: d

7. The eccentricity of hyperbola $4x^2 - 9y^2 = 36$ is

   a) 13/9   b) 13/3   c) 1/2   d) 1

   Ans: b

8. The angle between the asymptotes of the hyperbola $x^2 - y^2 = 2$ is

   a) 45°   b) 60°   c) 90°   d)0

   Ans: c

9. The distance between the foci of the hyperbola is four times the distance between the directrices then the eccentricity is
   a) 4   b) -2   c) 2   d) 4/3

   Ans: c

10. The distance between the directrices of a hyperbola is 5 and the distance between the vertices is 8 then e= a) 2   b) 7/5   c) 9/5   d) 8/5

   Ans: d

11. The distance between foci of a hyperbola is 36 and the T-axis is 9 the e =
    a) 2   b) 4   c) 3   d) ½

   Ans: b

12. The equation of the tangent to the hyperbola $4y^2-5x^2 = 80$ at (-2,5) is
    a) 2x-y = 8   b) x+y = 3   c) x+2y = 8   d) x + y = 8

   Ans: c

13. The angle between the Rectangular hyperbolas xy = 6 and $x^2-y^2 = 5$ at (3, 2) is
    a) 0º   b) 45º   c) 90º   d) 30º

   Ans: c

14. The centre of the conic $16x^2-25y^2+32x-100y-484 = 0$
    a) (2,1)   b) (-1,-2)   c) (1,2)   d) (-2,-1)

   Ans: b

15. The value of e of the hyperbola x = asec ; y = atan is
    a) 1   b) 3/5   c) 2   d) none

   Ans: c

16. If the eccentricity of the conic $x^2-y^2 = 5$
    a) 2   b)2   c) 1/ 2   d) 1/2

   Ans: a

17. The foci of the hyperbola are the points $9y^2 - 4x^2 = 36$ are the points
    a) (2,1)   b) $\left(1,\pm\sqrt{13}\right)$ c) $\left(\mp\sqrt{13},0\right)$ d) $\left(0,\pm\sqrt{13}\right)$

   Ans: d

18. The locus of points of intersection of perpendicular tangents drawn to the hyperbola $\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 1$
is   a) $x^2 + y^2 = a^2 + b^2$ b) $x^2 + y^2 = a^2$ c) $x^2 + y^2 = b^2$ d) $x^2 + y^2 = a^2 - b^2$

Ans: d

19. The length of the latus rectum of the hyperbola $3y^2 - x^2 = 27$ is
a) $2/\ 3$ b) 9   c)   3   d) 18

Ans: d

20. If one focus is (4,0) and the corresponding directrix is $x = 2$ then the hyperbola is
a) $\dfrac{x^2}{4} - \dfrac{y^2}{9} = 1$ b) $\dfrac{x^2}{9} - \dfrac{y^2}{4} = 1$ c) $x^2 - y^2 = 8$ d) $y^2 - x^2 = 8$

Ans: c