SRIGAYATRI EDUCATIONAL INSTITUTIONS

INDIA

SR MPC JEE MAINS

GEOMETRY – QUESTION BANK UT-03

STRAIGHT LINES AND PAIR OF STRAIGHT LINES

1. **Given the triangle with vertices** $A(10,4)\,B(-4,9)\,C(-2,1)$**, the equation of median through B is**

1) $3x+4y=92$ 2) $13x+16y=92$ 3) $13x-61y=9$ 4) $3x-4y=9$

2. **In what direction should a line de drawn through the point (1, 2) so that its point of intersection with the line** $x+y=4$ **is at a distance of** $\frac{\sqrt{6}}{3}$ **from the given point?**

1) 75^o 2) 60^o 3) 45^o 4) 90^o

3. **The values of** θ **and P, if the equation** $x\cos\theta+y\sin\theta=p$ **is the normal form of the line** $\sqrt{3}x+y+2=0$ **are**

1) $210^o,1$ 2) $210^o,2$ 3) $220^o,3$ 4) $220^o,4$

4. **If** t_1 **and** t_2 **are roots of the equation** $t^2+\lambda t+1=0$**, where** λ **is an arbitrary constant, then the line joining the points** $\left(at_1^2,2at_1\right)$ **and** $\left(at_2^2,2at_2\right)$ **always passes through a fixed point whose coordinates are**

1) $(a,0)$ 2) $(-a,0)$ 3) $(0,a)$ 4) $(0,-a)$

5. **The straight line** $ax+by+c=0$**, where** $abc\neq0$ **will pass through the first quadrant if**

1) $ac>0\ \&\ bc>0$ 2) $c>0\,\&\,bc<0$ 3) $bc>0\,\&\,ac>0$ 4) $ac<0\,\&\,bc<0$

6. **A light ray coming along the line** $3x+4y=5$ **gets reflected from the line** $ax+by=1$ **and goes along the line** $5x-12y=10$ **then**

1) $a=\frac{64}{115},b=\frac{112}{15}$ 2) $a=\frac{14}{15},b=\frac{-8}{115}$ 3) $a=\frac{64}{115},b=\frac{-8}{115}$ 4) $a=\frac{64}{15},b=\frac{14}{15}$

7. **The line** $x+y=|a|$ **and** $ax-y=1$ **intersect each other in the first quadrant, then the set of all possible values of a an interval**

1) $(-1,1]$ 2) $(0,\infty)$ 3) $[1,\infty)$ 4) $(-1,\infty)$

8. **If** $u=a_1x+b_1y+c_1=0,v=a_2x+b_2y+c_2=0$ **and** $\frac{a_1}{a_2}\neq\frac{b_1}{b_2}=\frac{c_1}{c_2}$**, then** $u+kv=0$ **represent**

1) $u=0$ 2) a family of concurrent lines

3) a family of parallel lines 4) none of the above

9. **The circumcentre of the triangle formed by the lines** $xy+2x+2y+4=0$ **and** $x+y+2=0$ **is**

1) $(0,0)$ 2) $(-1,-1)$ 3) $(-1,-2)$ 4) $(-2,-2)$

10. **A straight line through origin O meets the lines** $3y=10-4x$ **and** $8x+6y+5=0$ **at the points A and B respectively, then O divides the segment AB in the ratio**

1) 2:3 2) 1:2 3) 4:1 4) 3:4

11. **The diagonal of the rectangle formed by the lines** $x^2-7x+6=0$ **and** $y^2-14y+40=0$

1) $5x+6y=0$ 2) $5x-6y=0$ 3) $6x-5y+14=0$ 4) $6x-5y-14=0$

12. **A ray light is incident along a line which meets anthor line** $7x-y+1=0$ **at the point** $(0,1)$ **the ray is then reflected from this point along the line,** $y+2x=1$ **then the equation of the line of incidence of the ray of light is**

1) $41x-38y+38=0$ 2) $41x+25y-25=0$ 3) $41x+38y-38=0$ 4) $41x-25y+25=0$

13. If a line intercepted between the coordinate axes is trisected at a point A(4, 3). Which is nearer to x-axis then its equation is

1) $4x-3y=4$ 2) $x+3y=13$ 3) $3x+2y=18$ 4) $3x+8y=36$

14. If the x-intercept of some line L is double as that of the line $3x+4y=12$ and the y-intercept of L is half as that of the same line, then the slope of L is

1) -3 2) $\frac{-3}{8}$ 3) $\frac{-3}{2}$ 4) $\frac{-3}{16}$

15. The number of different straight lines that are formed with A(2, 3), B(3, 4), C(5, 6) and D(3, 7) are

1) 0 2) 4 3) 5 4) ${}^4C_2$

16. The equation $x^2-3xy+\lambda y^2+3x-5y+2=0$ when λ is a real number, represents a pair of straight lines. If θ is the angle between the lines, then $\cos ec^2\theta$ is equal to

1) 2 2) 4 3) 10 4) $\sqrt{10}$

17. The orthocenter of the triangle ABC is 'B' and the circumcentre is S(a, b). If A is the origin then the co-ordinate of G^1 are

1) $(2a,2b)$ 2) $\left(\frac{a}{2},\frac{b}{2}\right)$ 3) $\left(\sqrt{a^2+b^2},0\right)$ 4) $(a,2b)$

18. If a, b and c are three consecutive odd integers then the variable line $ax+by+c=0$ always passes through

1) $(2,1)$ 2) $(1,2)$ 3) $(-1,2)$ 4) $(1,-2)$

19. If $L: x+y=\frac{1}{2}$ intersects $x^2+y^2=1$ at 2 points A & B, then joint equation of passing through origin & points A and B is

1) $3x^2+3y^2+8xy=0$ 2) $8x^2+8y^2=3xy$ 3) $3x^2+8y^2=xy$ 4) $x^2+y^2=5xy$

20. A line through the variable point $A(k+1,2k)$ meets the lines $7x+y-16=0$, $5x-y-8=0, x-5y+8=0$ at B, C, D respectively, then AC, AB, AD are in

1) H.p 2) A.p 3) A.G.p 4) G.p

21. The equation of the line which is equidistance from parallel lines $9x+6y-7=0$ and $3x+2y+6=0$

1) $3x+2y+7=0$ 2) $18x+12y+11=0$ 3) $9x+6y-3=0$ 4) $18x+12y+13=0$

22. If the point $P(a^2,a)$ lies in the region corresponding to the acute angle between the lines $2y=x$ and $4y=x$, the value of a is

1) $a\in(2,5)$ 2) $a\in(2,4)$ 3) $a\in(1,2)$ 4) $a\in(3,4)$

23. In $\Delta ABC,$ vertex A is (1, 2). If the internal angle bisector of $\angle B$ is $2x-y+10=0$ and the perpendicular bisector of AC is $y=x$, then the equation of BC is

1) $5x+9y-18=0$ 2) $5x+9y-11=0$ 3) $5x+9y-19=0$ 4) $5x+9y-17=0$

24. The number of lines that are parallel to $2x+6y+7=0$ and have an intercept of length 10 between the co-ordinate axes is

1) 1 2) 2 3) 4 4) infinitely many

25. If P_1, P_2 are the lengths of the normal drawn from the origin on the lines $x\cos\theta+y\sin\theta=2a\cos 4\theta$ and $x\sec\theta+y\cos ec\theta=4a\cos 2\theta$ respectively, and $mp_1^2+np_2^2=4a^2$ then

1) $m=1,n=1$ 2) $m=1,n=4$ 3) $m=4,n=1$ 4) $m=1,n=-1$

26. The number of points on $x+y=4$ at distance 1 unit from the line $4x+3y-10=0$ are

27. **A square of area 25 sq. units is formed by taking two sides as** $3x+4y=k_1$ **and** $3x+4y=k_2$ **then** $|k_1-k_2|$ **is ___ units**

28. **A variable straight line through the point of intersection of the lines** $\frac{x}{3}+\frac{y}{4}=1$ **and** $\frac{x}{4}+\frac{y}{3}=1$ **meets the co-ordinate axes in A and B of locus of the mid-point of AB is** $2xy=k(x+y)$ **then the value of 343k is**

29. **A light ray emerging from the point source placed at P (1, 3) is reflected at a point Q in the axis of *x*. If the reflected ray passes through the point R (6, 7), then the abscissa of Q is**

30. **A family of the lines is given by** $(1+2\lambda)x+(1-\lambda)y+\lambda=0$, λ **being a parameter. The line belonging to this family at the maximum distance from the point (1, 4) is** $ax+by+c=0$ **then the value of** $\frac{a+b+c}{19}$

31. **If the equation** $3x^2+6xy+my^2=0$ **represents a pair of coincident straight lines, then** $\frac{3m}{2}$ **is equal to**

32. **The number of integral values of *m*, for which the *x*-coordinate of the point of intersection of the lines** $3x+4y=9$ **and** $y=mx+1$ **is also an integer is**

33. **A line L passes through the points (1,1) and (2,0) and another line** L^1 **passes through** $\left(\frac{1}{2},0\right)$ **and perpendicular to L. Then the area of the triangle to formed by the lines** L, L^1 **and y-axis is N, then the value of 16N is equal to**

34. **The point (4, 1) undergoes the following two successive transformations**
(i) Reflection about the line $y=x$
(ii) Translation through a distance 2 units along the positive x-axis then the final coordinates of the point are (x,y) **the value of** $2x+3y$ **is equal to**

35. **Two sides of a square lie on the lines** $x+y=1$ **and** $x+y+2=0$**, if the area *k* then 2*k* is**

36. **If the perpendicular bisector of the line segment joining the points P(1, 4) and Q(k, 3) has y-intercept equal to -4, then the value of** $|k|$ **is**

37. **Let the equations of two sides of a triangle be** $3x-2y+6=0$ **and** $4x+5y-20=0$ **of the orthocenter of this triangle is at (1, 1) then the equation of its third side is** $26x-122y=k$ **then *k* is equal to**

38. **If the straight line** $2x-3y+17=0$ **is perpendicular to the line passing through the points A(7, 17) and** $(15,\beta)$ **then** β **equals**

39. **If one of the line given by** $6x^2-xy+4cy^2=0$ **is** $3x+4y=0$**, then *C* equal to**

40. **Let A(1,0), B(6,2) and** $C\left(\frac{3}{2},6\right)$ **be the vertices of a** ΔABC. **If P is a point inside the** ΔABC **such that the triangles** APC, APB **and** BPC **have equal areas, then the length of the line segment PQ, where Q is the point** $\left(-\frac{7}{6},-\frac{1}{3}\right)$ **is _____**

CIRCLES

1. **A Circle touches the y-axis at (0, 2) and has an Intercept of 4 units on the positive side of the x-axis. Then the equation of the circle is**

1) $x^2+y^2-4\left(\sqrt{2}x+y\right)+4=0$ 2) $x^2+y^2-4\left(x+\sqrt{2}y\right)+4=0$

3) $x^2+y^2-2\left(\sqrt{2}x+y\right)+4=0$ 4) $x^2+y^2-2\left(x+\sqrt{2}y\right)+4=0$

2. **C_1 is a circle of radius 'T' touching x-axis and the y-axis, C_2 is another circle of radius >1, and touching the axes as well as the circle C_1, then the radius of C_2 is**

1) $3-2\sqrt{2}$ 2) $3+2\sqrt{2}$ 3) $3+2\sqrt{3}$ 4) $3-2\sqrt{3}$

3. **The intercept on the line $y=x$ by the circle $x^2+y^2-2x=0$ is AB. The equation of the circle with AB as a diameter is**

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

4. **Two circles each of radius 5, have a common tangent at (1, 1) whose equation is $3x+4y=7$ then their centres are**

1) $(4,-5),(-2,3)$ 2) $(4,-3),(-2,5)$ 3) $(4,5),(-2,-3)$ 4) $(1,2),(2,3)$

5. **Two distinct chords drawn from the point (p, q) on the circle $x^2+y^2=px+qy$ where $pq\neq 0$ are bisected by the x-axis then**

1) $|p|=|q|$ 2) $p^2=8q^2$ 3) $p^2<8q^2$ 4) $p^2>8q^2$

6. **The length of the chord of the circle $x^2+y^2=9$ passing through (3, 0) and perpendicular to the line $y+x=0$ is**

1) $\frac{3}{\sqrt{2}}$ 2) $3\sqrt{2}$ 3) $2\sqrt{3}$ 4) $5\sqrt{2}$

7. **The equation of the diameter of the circle $3\left(x^2+y^2\right)-2x+6y-9=0$ which is perpendicular to the line $2x+3y=12$ is**

1) $3x-2y=3$ 2) $3x-2y+1=0$ 3) $3x-2y=0$ 4) $3x+2y=7$

8. **The range of values of λ for which the circles $x^2+y^2=4$ and $x^2+y^2-4\lambda x+9=0$ have two common tangent is**

1) $\lambda\in\left[\frac{-13}{8},\frac{13}{8}\right]$ 2) $\lambda>\frac{13}{8},\lambda<\frac{-13}{8}$ 3) $1<\lambda<\frac{13}{8}$ 4) $3<\lambda<\frac{13}{6}$

9. **If the points A(1, 4) and B are symmetrical about the tangent to the circle $x^2+y^2-x+y=0$ at the origin then the co-ordinates of B are**

1) $(1,2)$ 2) $\left(\sqrt{2},1\right)$ 3) $(4,1)$ 4) $(5,2)$

10. **The angle between the pair of tangents from the point $\left(1,\frac{1}{2}\right)$ to the circle $x^2+y^2+4x+2y-4=0$ is**

1) $\cos^{-1}\left(\frac{4}{5}\right)$ 2) $\sin^{-1}\left(\frac{4}{5}\right)$ 3) $\sin^{-1}\left(\frac{3}{5}\right)$ 4) $\sin^{-1}\left(\frac{5}{7}\right)$

11. **The chords of contact of the pair of tangents to the circle $x^2+y^2=1$ drawn from any point on the line $2x+y=4$ passes through the point**

1) $\left(\frac{1}{2},\frac{1}{4}\right)$ 2) $\left(\frac{1}{4},\frac{1}{2}\right)$ 3) $\left(1,\frac{1}{2}\right)$ 4) $\left(\frac{1}{2},1\right)$

12. **The line $\lambda x+\mu y=1$ is a normal to the circle $2x^2+2y^2-5x+6y-1=0$ if**

1) $5\lambda-6\mu=2$ 2) $4+5\mu=6\lambda$ 3) $4+6\mu=5\lambda$ 4) $\lambda+\mu=3$

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

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

14. The equation of two circles $x^2+y^2+2\lambda x+5=0$ and $x^2+y^2+2\lambda y+5=0$ p is any point on the line $x-y=0$ if pA and pB are lengths of the tangents from 'p' to the two circles and pA=3 then pB =

1) 1.5 2) 6 3) 3 4) 2

15. If common chord of the circles $x^2+(y-\lambda)^2=16$ and $x^2+y^2=16$ subtend a right angle at the origin then λ is equal to

1) 4 2) $4\sqrt{2}$ 3) $\pm4\sqrt{2}$ 4) 8

16. The equation of a circle $x^2+y^2=4$. The centre of smallest circle touching this circle and the line $x+y=5\sqrt{2}$ has the coordinates

1) $\left(\frac{7}{2\sqrt{2}},\frac{7}{2\sqrt{2}}\right)$ 2) $\left(\frac{3}{2},\frac{3}{2}\right)$ 3) $\left(\frac{-7}{2\sqrt{2}},\frac{-7}{2\sqrt{2}}\right)$ 4) none of these

17. The members of a family of circles are given by the equation $2\left(x^2+y^2\right)+\lambda x-\left(1+\lambda^2\right)y-10=0$ the number of circles belonging to the family that are cut orthogonally by the fixed circle $x^2+y^2+4x+6y+3=0$

1) 2 2) 1 3) 0 4) -1

18. The locus of centre of the circles passing through the intersection of the circles $x^2+y^2=1$ and $x^2+y^2-2x+y=0$ is

1) A line whose equation is $x+2y=0$ 2) A line whose equation is $x-2y=1$

3) A circle 4) A pair of lines

19. Find the slope of radical axis for circles $S=x^2+y^2-3x-4y+5=0$, $S^1=3x^2+3y^2-7x+8y+11=0$

1) $\frac{-1}{10}$ 2) -10 3) 1 4) 3

20. $S=x^2+y^2-12x-16y+64=0$, $S^{'}=3x^2+3y^2-36x+81=0$, $S^{11}=x^2+y^2-16x+81=0$ **final co-ordinates of a point which the length of tangents drawn to each circle is equal**

1) $\left(\frac{7}{2},\frac{-3}{16}\right)$ 2) $\left(\frac{7}{3},\frac{-5}{6}\right)$ 3) $\left(\frac{11}{2},\frac{15}{4}\right)$ 4) $\left(\frac{-7}{2},\frac{-13}{6}\right)$

21. The length of the chord of the circle $x^2+y^2=\frac{1}{4}$ on the y-axis is

1) 1 2) 2 3) $\frac{1}{2}$ 4) 5

22. There are two circles whose equations are $x^2+y^2=9, x^2+y^2-8x-6y+n^2=0$, $n\in z$ if the two circles have exactly two common tangents then the number of possible values of 'n' is

1) 2 2) 8 3) 9 4) 10

23. The number of common tangents to the circle $x^2+y^2=4$ and $x^2+y^2-6x-8y-24=0$ is

1) 0 2) 1 3) 3 4) 4

24. The number of common tangents to the circle $x^2+y^2+2x+8y-23=0$ and $x^2+y^2-4x-10y+19=0$ is

1) 1 2) 2 3) 3 4) 4

25. Lines are drawn through the points $p(-2,-3)$ to meet the circle $x^2+y^2-2x-10y+1=0$. The length of the line segment pA, A being the point on the circle where the line meet the circle at coincident point is

1) 16 2) $4\sqrt{3}$ 3) 48 4) 36

26. **The common chord of the circles $x^2+y^2+6x+8y-7=0$ and a circle passing through the origin and touching the line $y=x$ always passes through a point**

1) $\left(\frac{-1}{2},\frac{1}{2}\right)$ 2) $(1,1)$ 3) $\left(\frac{1}{2},\frac{1}{2}\right)$ 4) $(-1,-1)$

27. **A ray of light incident at the point (-2, -1) gets reflected from the tangent at (0, -1) to the circle $x^2+y^2=1$. The reflected ray touches the circle. The equation of the line along which the incident ray moved is**

1) $4x-3y+11=0$ 2) $4x+3y+11=0$ 3) $8x+4y+11=0$ 4) none of these

28. **The locus of centres of circle passing through the origin and intersecting the fixed circle $x^2+y^2-5x+3y-1=0$ orthogonally is**

1) A straight line of the slope 3/5 2) A circle
3) A pair of straight lines 4) $5x-3y+1=0$

PARABOLA

29. **Equation of the parabola having focus (3, 2) and vertex (-1, 2) is**

1) $(x+1)^2=16(y-2)$ 2) $(x-1)^2=16(y+2)$ 3) $(y-2)^2=16(x+1)$ 4) $(y+2)^2=16(x-1)$

30. **The focus and directrix of a parabola are (1, -1) and $x+y+3=0$ its vertex is**

1) $\left(\frac{x}{4},\frac{1}{4}\right)$ 2) $\left(\frac{1}{2},\frac{-7}{4}\right)$ 3) $\left(\frac{1}{4},\frac{-7}{4}\right)$ 4) $\left(\frac{1}{2},\frac{5}{2}\right)$

31. **Focus of the parabola $4x^2-12x+8y+13=0$ is**

1) $\left(\frac{3}{2},-2\right)$ 2) $\left(\frac{3}{2},-5\right)$ 3) $\left(\frac{3}{2},-3\right)$ 4) $\left(\frac{3}{2},-1\right)$

32. **The focus and diretrix of a parabola (1, 2) and $2x-3y+1=0$. The equation of the tangent at the vertex is**

1) $4x-6y+5=0$ 2) $4x-6y+9=0$ 3) $4x-6y+11=0$ 4) $4x-6y+7=0$

33. **Area of the triangle formed by the vertex focus and one end of latusrectum of the parabola $(x+2)^2=-12(y-1)$ is**

1) 18 2) 36 3) 12 4) 9

34. **Equation of the tangent to $y^2=8x$ inclined at an angle 30^o to the axis is**

1) $x+\sqrt{3}y+6=0$ 2) $x-\sqrt{3}y+6=0$ 3) $\sqrt{3}x+y+6=0$ 4) $\sqrt{3}x-y+6=0$

35. **Equation of the tangent to $x^2-4x-8y+12=0$ at $\left(4,\frac{3}{2}\right)$ is**

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

36. **If p is a point on the parabola $y^2=4ax$ in which the abscissa is equal to ordinate the normal at p is**

1) $2x+y-12a=0$ 2) $x+2y-12a=0$ 3) $2x+y-18a=0$ 4) $2x+y+18a=0$

37. **The length of latusrectum of the parabola $169\left[(x-1)^2+(y-3)^2\right]=(5x-12y+17)^2$ is**

1) 1.076 2) 0.538 3) 2.154 4) 4.308

38. **A parabola with vertex (2, 3) and axis paraller to the y-axis passes through (4, 5) then its length of latusrectum is**

1) 2.00 2) 4.00 3) 0.50 4) 2.50

39. ***M* is the foot of the perpendicular from a point *P* on the parabola $y^2=8(x-3)$ to its directrix and *s* is the focus of the parabola, if SPM is an equilateral, triangle then length of each sides of the triangle**

1) 2.00 2) 3.00 3) 4.00 4) 8.00

40. **If (x_1, y_1) and (x_2, y_2) are the extremities of a focal chord of the parabola $y^2 = 16x$, then** $4x_1x_2 + y_1y_2 =$

1) -48.00 2) 0.00 3) -64.00 4) 16.00

41. **If two tangents are drawn from (-2, -1) to the parabola $y^2 = 4x$ if α is the angle between these tangents then** $\tan\alpha =$

1) 2.00 2) 3.00 3) 4.00 4) 5.00

42. **The equation of the parabola whose focus is (3, -4) and directrix $x - y + 5 = 0$ is**

1) $x^2 + y^2 + 2xy - 22x + 26y + 25 = 0$ 2) $x^2 + y^2 + 2xy + 22x - 26y + 25 = 0$

3) $x^2 + y^2 + 2xy + 22x + 26y - 25 = 0$ 4) $x^2 + y^2 + 2xy - 22x - 26y - 25 = 0$

43. **If the two ends of the latusrectum are given then maximum number of parabolas that can be drawn is**

1) 1 2) 2 3) 0 4) infinite

44. **The point on $y^2 = 4ax$ nearest to the focus has its abscissa**

1) $x = -a$ 2) $x = a$ 3) $x = \frac{3}{2}$ 4) $x = 0$

45. **The vertex of the parabola $x^2 + 2y = 8x - 7$ is**

1) $\left(4, \frac{7}{2}\right)$ 2) $\left(4, \frac{9}{2}\right)$ 3) $\left(\frac{9}{2}, 4\right)$ 4) $(1, 0)$

46. **If $(2, -8)$ is at an end of a focal chard of the parabola $y^2 = 32x$, then the coordinates of the other end of the chord is**

1) $(8, -2)$ 2) $(16, 32)$ 3) $(32, -32)$ 4) $(-2, 8)$

47. **If the line $y = 3x + c$ touches the parabola $y^2 = 12x$ at point *p*, then the equation of the tangent at point Q, where PQ is a focal chord**

1) $x + 3y + 27 = 0$ 2) $3x - y - 27 = 0$ 3) $x + 3y - 27 = 0$ 4) $x - 3y = 0$

48. **The equation of tangent to the parabola $y^2 = 8x$ having slope 2 is**

1) $y = 2x + 1$ 2) $y = 2x + 4$ 3) $y = 2x + 3$ 4) $y = 2x + 2$

49. **If two equal parabolas having the same vertex and their axes are at right angles. Then the length of their common tangent is**

1) $3a$ 2) $3\sqrt{2}a$ 3) $\frac{3}{\sqrt{2}}a$ 4) $\sqrt{2}a$

50. **If y_1, y_2 are the ordinates of two points P and Q on the parabola and y_3 is the ordinate of the point of intersection of tangents at P and Q then**

1) y_1, y_2, y_3 are in A.P 2) y_1, y_3, y_2 are in A.P

3) y_1, y_2, y_3 are in G.P 4) y_1, y_3, y_2 are in G.P

51. **The condition that the straight line $lx + my + n = 0$ touches the parabola $x^2 = 4ay$ is**

1) $bn = am^2$ 2) $al^2 = mn$ 3) $\ln = am^2$ 4) $am = \ln^2$

52. **The point $(-2m, m+1)$ is a interior point of the smaller region bounded by the circle $x^2 + y^2 = 4$ and parabola $y^2 = 4x$, then *m* belongs to the interval**

1) $-5 - 2\sqrt{6}, m < 1$ 2) $0 < m < 4$ 3) $-1 < m < \frac{3}{5}$ 4) $-1 < m < -5 + 2\sqrt{6}$

53. **Locus of trisection point of any double ordinate of $y^2 = 4ax$ is**

1) $3y^2 = 4ax$ 2) $y^2 = 6ax$ 3) $9y^2 = 4ax$ 4) $y^2 = 2ax$

54. **If the tangent at *p* on $y^2 = 4ax$ meets the tangent at the vertex in Q and S is the focus of the parabola then $\angle SQP$ is equal to**

1) $\frac{5}{3}$ 2) $\frac{5}{4}$ 3) $\frac{\pi}{2}$ 4) $\frac{2\pi}{3}$

55. The locus of a point from which tangents to a parabola at right angles is

1) a straight line 2) a pair of straight lines
3) a circle 4) a parabola

56. The parabola $y^2 = 4x$ and $(x-6)^2 + y^2 = r^2$ will have no common tangent, if

1) $r > \sqrt{20}$ 2) $r < \sqrt{20}$ 3) $r > \sqrt{18}$ 4) $(\sqrt{20}, \sqrt{20})$

57. The locus of the middle point of chords of the parabola $y^2 = 8x$ drawn through the vertex is a parabola whose

1) focus is (2, 0) 2) latusrectum is 8 3) focus is (0, 2) 4) latusrectum is 4

58. Tangent and normal drawn to the parabola at $A(at^2, 2at), t \neq 0$ meet x-axis at points B and D respectively. If the rectangle ABCD is complete then the locus of 'C' is

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

59. The equation of a tangent to the parabola $y^2 = 8x$ is $y = x + 2$ the point on this line from which the other tangent to the parabola is perpendicular to the given tangent is

1) $(-1,1)$ 2) $(0,2)$ 3) $(2,0)$ 4) $(-2,0)$

60. The value of λ for which the curve $(7x+5)^2 + (7x+3)^2 = \lambda^2(4x+3y-24)^2$ represents a parabola

1) $\pm\frac{6}{5}$ 2) $\pm\frac{7}{5}$ 3) $\pm\frac{1}{5}$ 4) $\pm\frac{2}{5}$

61. The slope of the line touching both the parabolas $y^2 = 4x$ and $x^2 = -32y$ is

1) 0.50 2) 1.50 3) 0.12 4) 0.66

62. If the straight line $y = \pm x$ intersect the parabola $y^2 = 8x$ in points p and Q, then length of PQ is

1) 4.00 2) 3.00 3) 8.00 4) 16.00

63. The equation $y^2 + 4x + 4y + k = 0$ represent a parabola whose latus rectum is

1) 1.00 2) 2.00 3) 3.00 4) 4.00

64. The normal chord at a point 't' on the parabola $y^2 = 4ax$ subtends a right angle at the vertex then t^2 is equal to

1) 4.00 2) 2.00 3) 1.00 4) 3.00

65. The tangents from origin to $y^2 + 4 = 4x$ are include at an angle 'α' (in radian) then $\frac{\pi}{\alpha}$ is

1) 6.00 2) 4.00 3) 3.00 4) 2.00

66. The number of distinct normals that can be drawn from (-2, 1) to the parabola $y^2 - 4x - 2y - 3 = 0$ is

1) 1 2) 2 3) 3 4) 0

67. The area of the triangle formed by the tangent and normal to the parabola $y^2 = 4ax$ both drawn at the same end of the latusrectum and the axis of the parabola is

1) $2\sqrt{2}a^2$ 2) $2a^2$ 3) $4a^2$ 4) $7a^2$

68. If two of three feet of normal drawn from a point to the parabola $y^2 = 4x$ be (1, 2) and (1, -2) then third foot is

1) $(2, 2\sqrt{2})$ 2) $(2, -2\sqrt{2})$ 3) $(0,0)$ 4) $(1,2)$

69. Let P, Q, R be three points on a parabola, normal at which are concurrent. The centroid of the ΔPQR must lies on

1) A line parallel to directrix 2) The axis of the parabola
3) C line of slope 'l' passing through the origin 4) A line perpendicular to directrix

70. **The vertex of the parabola $y^2=8x$ is at the centre of a circle and the parabola cuts the circle at the end points of its latusrectum then the equation of the circle is**

1) $x^2+y^2=4$ 2) $x^2+y^2=20$ 3) $x^2+y^2=80$ 4) $x^2+y^2=1$

71. **The circle $x^2+y^2+2\lambda x=0$, $\lambda\in R$ touches the parabola $y^2=4x$ externally then**

1) $\lambda>0$ 2) $\lambda<0$ 3) $\lambda>1$ 4) $\lambda=0$

72. **The locus of middle points of chords of a parabola which subtend a right angle at the vertex of the parabola is**

1) A circle 2) An ellipse 3) A parabola 4) A hyperbola

73. **The locus of a point from which tangents to a parabola are at right angles is a**

1) straight lines 2) pair of straight lines3) circle 4) parabola

74. ***p* is a point two tangents are drawn from it to the parabola $y^2=4x$ such that slope of one tangent is three times the slope of the other. The locus of *p* is**

1) A straight line 2) A circle 3) A parabola 4) An ellipse

75. **The locus of middle points of parallel chords of a parabola $x^2=4ay$ is a**

1) A straight line parallel to x-axis 2) straight line parallel to y-axis
3) circle 4) straight line parallel to bisector of the angles between the axes

ELLIPSE

1. **If $P(x,y)$ is any point on the ellipse $16x^2+25y^2=400$ and $F_1=(3,0), F_2=(-3,0)$, then the value of PF_1+PF_2**

1) 12 2) 6 3) 5 4) 10

2. **If $(5,12)$ *and* $(24,7)$ are the foci of an ellipse passing through the origin, then the eccentricity of ellipse is**

1) $\frac{\sqrt{386}}{12}$ 2) $\frac{\sqrt{386}}{38}$ 3) $\frac{\sqrt{386}}{13}$ 4) $\frac{\sqrt{386}}{26}$

3. **If the equation $(5x-1)^2+(5y-2)^2=(\lambda^2-2\lambda+1)(3x+4y-1)^2$ represents an ellipse, then values of $\lambda\in$**

1) $(0,2)-\{1\}$ 2) $(0,2)$ 3) $[0,2]$ 4) R

4. **The area of the greatest rectangle that can be inscribed in the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$**

1) ab 2) $\frac{1}{2}ab$ 3) $2ab$ 4) $4ab$

5. **The auxiliary circle as a family of ellipse passes through the origin and makes intercepts of 8 units and 6 units on the X-axis and Y-axis respectively If eccentricity of all such ellipses is $\frac{1}{2}$, then the locus of the focus is**

1) $x^2+y^2=\frac{25}{4}$ 2) $(x-4)^2+(y-3)^2=\frac{25}{4}$
3) $(x-3)^2+(y-4)^2=\frac{25}{4}$ 4) $x^2+y^2=\frac{4}{25}$

6. **The number of rational points on the ellipse $\frac{x^2}{9}+\frac{y^2}{4}=1$**

1) 2 2) 3 3) 10 4) Infinite

7. **If PSQ is a focal chord of th ellipse $16x^2+25y^2=400$ such that $SP=8$, then the length of SQ is equal to**

1) 2 2) 3 3) $\frac{1}{2}$ 4) $\frac{1}{3}$

8. **If** $\frac{x}{a}+\frac{y}{b}=\sqrt{2}$ **touch the ellipse** $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ **then its eccentric angle** θ **of point of contact is**

1) 90^0 2) 60^0 3) 45^0 4) 30^0

9. **Let** θ **be the angle between the pair of tangents from the point** $(1,2)$ **to the ellipse** $3x^2+2y^2=5$ **then** $\tan\theta$ **is equal to**

1) $\frac{12}{5}$ 2) $\frac{12}{\sqrt{5}}$ 3) $\frac{5}{12}$ 4) $\frac{\sqrt{5}}{12}$

10. **If** F_1 *and* F_2 **are the feet of the perpendiculars from the foci** S_1 **and** S_2 **of the ellipse** $\frac{x^2}{25}+\frac{b^2}{16}=1$ **on the tangent at and point P on the ellipse then** $S_1F_1+S_2F_2\ge$ ___

1) 16 2) 10 3) 8 4) 18

11. **If** ω **is one of the angle between the normals to the ellipse** $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ **at the points whose eccentric angle are** θ **and** $\frac{\pi}{2}+\theta$ **then** $\frac{2\cot\omega}{\sin 2\theta}$ **is equal to**

1) 0 2) $\frac{e^2}{\sqrt{1-e^2}}$ 3) e 4) $\frac{e^2}{\sqrt{1+e^2}}$

12. **Let** e_1 **and** e_2 **be the eccentricities of the ellipse** $\frac{x^2}{25}+\frac{y^2}{b^2}=1(b<5)$ **and the hyperbola** $\frac{x^2}{16}-\frac{y^2}{b^2}=1$ **respectively satisfying** $e_1e_2=1$**.If** α *and* β **are the distance between the focii of the ellipse and the foci of the hyperbola respectively. Then the ordered pair of** (α,β) **is equal to**

1) $(8,12)$ 2) $\left(\frac{20}{3},12\right)$ 3) $\left(\frac{24}{5},10\right)$ 4) $(8,10)$

13. **Let** $x=4$ **be a directrix to an ellipse whose centre is at the origin and its eccentricity is** $\frac{1}{2}$ **If** $P(1,\beta),\beta>0$ **is a point on this ellipse, the equation of the normal to if at P.is**

1) $4x-2y=1$ 2) $4x-3y=2$ 3) $7x-4y=1$ 4) $8x-2y=5$

14. **Which of the following points lies on the locus of the foot of perpendicular drawn upon any tangent to ellipse** $\frac{x^2}{4}+\frac{y^2}{2}=1$ **from any of its foci?**

1) $(-2,\sqrt{3})$ 2) $(-1,\sqrt{2})$ 3) $(-1,\sqrt{3})$ 4) $(1,2)$

15. **The length of the minor axis (along y-axis) of an ellipse is the standard form is** $\frac{4}{\sqrt{3}}$ **.If this ellipse touches the line** $x+6y=8$**,then its eccentricity is**

1) $\frac{1}{2}\sqrt{5/3}$ 2) $\frac{1}{2}\sqrt{\frac{11}{3}}$ 3) $\sqrt{5/6}$ 4) $\frac{1}{3}\sqrt{\frac{11}{3}}$

16. **If the tangent to the parabola** $y^2=x$ **at** $(\alpha,\beta)(\beta>0)$ **is also a tangent to the ellipse** $x^2+2y^2=1,$ **then** α **equal to**

1) $\sqrt{2}-1$ 2) $\sqrt{2}+1$ 3) $2\sqrt{2}+1$ 4) $2\sqrt{2}-1$

17. **If the normal to the ellipse** $3x^2+4y^2=12$ **at a point P on it is parallel to the line** $2x+y=4$ **and the tangent to the ellipse at P passes through** $Q(4,4)$ **then** PQ **is equal to**

1) $\frac{\sqrt{221}}{2}$ 2) $\frac{\sqrt{157}}{2}$ 3) $\frac{5\sqrt{5}}{2}$ 4) $\frac{\sqrt{61}}{2}$

18. An ellipse, with foci at $(0,2)$ and $(0,-2)$ and minor axis of length 4, passes through which of the following points?

1) $(\sqrt{2},2)$ 2) $(2,\sqrt{2})$ 3) $(2,2\sqrt{2})$ 4) $(1,2\sqrt{2})$

19. If tangents are drawn to the ellipse $x^2+2y^2=2$ at all points on the ellipse other than its four vertices, then the mid points of the tangents intercepted between the coordinate axis lie on the curve

1) $\frac{1}{2x^2}+\frac{1}{4y^2}=1$ 2) $\frac{x^2}{2}+\frac{y^2}{4}=1$ 3) $\frac{1}{4x^2}+\frac{1}{2y^2}=1$ 4) $\frac{x^2}{4}+\frac{y^2}{2}=1$

20. Let S and S^1 be the foci of an ellipse and B be any one of the extremities of its minor axis. If ΔS^1BS is right angled triangle with right angle at B and Area of $\Delta S^1BS=8$ sq units then the length of a latusrectum of the ellipse is

1) 2 2) 4 3) $4\sqrt{2}$ 4) $2\sqrt{2}$

21. If the length of the latusretum of an ellipse is 4units and the distance between a focus and its nearest vertex on the major axis $\frac{3}{2}$ units, then its eccentricity is

1) $\frac{1}{3}$ 2) $\frac{2}{3}$ 3) $\frac{1}{9}$ 4) $\frac{1}{2}$

22. The eccentricity of an ellipse whose centre is at the origin is $\frac{1}{2}$,if one of its directrix is $x=-4$, then the equation of the normal to it at $\left(1,\frac{3}{2}\right)$ is

1) $4x-2y=1$ 2) $4x+2y=7$ 3) $x+2y=4$ 4) $2y-x=2$

23. The locus of the foot of the perpendicular drawn from the centre of the ellipse $x^2+3y^2=6$ on any tangent is

1) $(x^2-y^2)^2=6x^2-2y^2$ 2) $(x^2+y^2)^2=6x^2+2y^2$

3) $(x^2+y^2)^2=6x^2-2y^2$ 4) $(x^2-y^2)^2=6x^2+2y^2$

24. If the tangent at a point on the ellipse $\frac{x^2}{27}+\frac{y^2}{3}=1$ meets the coordinate axis at A and B, and O is the origin, then the minimum area (in sq units) of the triangle OAB is

1) $3\sqrt{3}$ 2) $\frac{9}{2}$ 3) 9 4) $9\sqrt{3}$

25. The equation of the circle passing through the foci of the ellipse $\frac{x^2}{16}+\frac{y^2}{9}=1$ and having centre at $(0,3)$ is

1) $x^2+y^2-6y+7=0$ 2) $x^2+y^2-6y-5=0$

3) $x^2+y^2-6y+5=0$ 4) $x^2+y^2-6y-7=0$

26. If C is the center and A, B are two points on the conic $4x^2+9y^2-8x-36y+4=0$ such that $\angle ACB=90^0$, and $\frac{1}{CA^2}+\frac{1}{CB^2}=K$ then the value of 36K is

27. **If the line** $\ell n+my+n=0$ **cuts the ellipse** $\frac{x^2}{a^2}+\frac{b^2}{b^2}=1$ **at points whose eccentric angles differed by** $\pi/2$ **then the value of** $\frac{a^2\ell^2+b^2m^2}{n^2}=$

28. **If S and** S^1 **are two foci of the ellipse** $16x^2+25y^2=40$ **and** PSQ **is a focal chord such that SP=16 then** $9S^1Q=$

29. **the number of eccentric angles of a point on the ellipse** $\frac{x^2}{6}+\frac{y^2}{2}=1$ **whose distance from the centre of the ellipse is** $\sqrt{5}$

30. **Let** $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1(a>b)$ **be a given ellipse, length if whose latusrectum is 10, if its eccentricity is the maximum value of the function** $Q(t)=\frac{5}{12}+t-t^2$**,then** a^2+b^2 **is equal to**

31. **If the coordinates of two points A and B are** $(\sqrt{7},0)$ **and** $(-\sqrt{7},0)$ **and P is any point on the conic,** $9x^2+16y^2=144,$ **then** $PA+PB=$

32. **If the point P on the curve** $4x^2+5y^2=20$ **is farthest from the point** $Q(0,-4)$ **then** PQ^2 **is equal to**

33. **If the normal at an end of a latusrectum of an ellipse passes through an extremity of the minor axis, and e be eccentricity of the ellipse then** e^4+e^2 **is equal to**

34. **If the distance between the foci of an ellipse is 6 and the distance between its directrices is 12, and the length of latusrectum is 'L' then the value of** $\sqrt{2}$ **L is**

35. **If** $3x+4y=12\sqrt{2}$ **is a tangent to the ellipse** $\frac{x^2}{a^2}+\frac{y^2}{9}=1$ **for some** $a\in R$ **and the distance between the foci is** $\frac{k}{\sqrt{7}}$ **,then the value of k is**

36. **Let the line** $y=mx$ **and the ellipse** $2x^2+y^2=1$ **intersect at a point P in the first quadrant. If the normal to this ellipse at P meets the Co-ordinate axes at** $\left(-\frac{1}{3\sqrt{2}},0\right)$ **and** $(0,\beta)$ **then** $3\beta=$

37. **If the tangents on the ellipse** $4x^2+y^2=8$ **at the points** $(1,2)$ **and** (a,b) **are perpendicular to each other, then the value of** $17a^2$ **is**

38. **In an ellipse with centre at the origin if the difference of the length of major axis and minor axis is 10 and one of the foci is at** $(0,5\sqrt{3})$**,then the length of its latusrectum is**

39. **If the line** $x-2y=12$ **is tangent to the ellipse** $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ **at the point** $\left(3,-\frac{9}{2}\right)$**,then the length of the latusretum of the ellipse is**

40. **The tangent and normal to the ellipse** $3x^2+5y^2=32$ **at** $P(2,2)$ **meets the x-axis at Q and R, the area of** ΔPQR **(in the sq. units) is 15A then the value of A is**

HYPERBOLA

1. **If hyperbola** $\frac{x^2}{b^2}-\frac{y^2}{a^2}=1$ **passes through the focus of ellipse** $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ **then eccentricity of hyperbola is**

1) $\frac{1}{\sqrt{2}}$ 2) $\sqrt{3}$ 3) $\sqrt{2}$ 4) $\frac{1}{\sqrt{3}}$

2. **The eccentricity of the hyperbola given by equations** $x=\frac{e^t+e^{-t}}{2}$ **and** $y=\frac{e^t-e^{-t}}{3}$**,** $t\in R$

1) $\frac{\sqrt{13}}{3}$ 2) $\frac{\sqrt{3}}{13}$ 3) $\frac{3}{\sqrt{13}}$ 4) $\sqrt{\frac{13}{3}}$

3. **If** PQ **is a double ordinate of the hyperbola** $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ **such that OPQ is an equilateral triangle, O begining the centre of the hyperbola, the range of eccentricity of the hyperbola**

1) $e<\frac{2}{\sqrt{3}}$ 2) $e>\frac{2}{\sqrt{3}}$ 3) $C>\frac{3}{\sqrt{2}}$ 4) $e>\frac{\sqrt{2}}{3}$

4. **The centre of the hyperbola** $\frac{(3x-4y-12)^2}{100}-\frac{(4x+3y-12)^2}{225}=1$ **is**

1) $(0,0)$ 2) $(1,2)$ 3) $\left(\frac{84}{25},\frac{-12}{25}\right)$ 4) $\left(\frac{12}{25},\frac{84}{45}\right)$

5. **For all real values as m, the straight line** $y=mx+\sqrt{9m^2-4}$ **is a tangent to which of the following certain hyperbola?**

1) $9x^2+4y^2=36$ 2) $4x^2+9y^2=36$ 3) $9x^2-4y^2=36$ 4) $4x^2-9y^2=36$

6. **The equation of tangents to the curve** $4x^2-9y^2=1$ **which are parallel to** $4y=5x+7$

1) $24x-30y=\pm\sqrt{161}$ 2) $24y-30x=\pm\sqrt{161}$ 3) $24x+30y=\pm\sqrt{161}$ 4) $24y+30x=\pm\sqrt{161}$

7. **The equation of the common tangent to the curves** $y^2=8x$ **and** $xy=-1$

1) $y=x+2$ 2) $y=2x+1$ 3) $y=-x+2$ 4) $y=x+4$

8. **P is a point on the hyperbola** $\frac{x^2}{a^2}-\frac{b^2}{b^2}=1$**,N is the foot of the perpendicular from P on the transverse axis. The tangent to the hyperbola at P meets the transverse axis at T . If O is the centre of the hyperbola, then the value of** $OT\times ON$ **is equal to**

1) a 2) a^2 3) b 4) b^2

9. **Tangents drawn from the point** (c,d) **to the hyperbola** $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ **makes angles** α **and** β **with the** $x-axis$**. If** $\tan\alpha\tan\beta=1$**, then the value of** $c^2-d^2=$

1) b^2 2) a^2 3) a^2-b^2 4) a^2+b^2

10. **The eccentricity of the hyperbola with asymptotes** $3x+4y=2$ **and** $4x-3y=2$

1) $\sqrt{3}$ 2) 2 3) $\sqrt{2}$ 4) 3

11. **For some** $\theta\in\left(0,\frac{\pi}{2}\right)$**,If the eccentricity of the hyperbola,** $x^2-y^2\sec^2\theta=10$ **is** $\sqrt{5}$ **times the eccentricity of the ellipse** $x^2\sec^2\theta+y^2=5$**, then**

1) $2\sqrt{6}$ 2) $\frac{2\sqrt{5}}{3}$ 3) $\frac{4\sqrt{5}}{3}$ 4) $\sqrt{30}$

12. **A hyperbola having the transverse axis of length** $\sqrt{2}$ **has the same foci as that of the ellipse** $3x^2+4y^2=12$**,then this hyperbola does not pass through which of the following points?**

1) $\left(\frac{1}{\sqrt{2}},0\right)$ 2) $\left(\frac{-\sqrt{3}}{\sqrt{2}},1\right)$ 3) $\left(1,-\frac{-1}{2}\right)$ 4) $\left(\sqrt{\frac{3}{2}},\frac{1}{\sqrt{2}}\right)$

13. **Let $P(3,3)$ be a point on the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$. If the normal to it at P intersects the $x-axis$ at (9.0) and e is its eccentricity, then the ordered pair of (a^2,e^2) is equal to**

1) $\left(\frac{3}{2},2\right)$ 2) $\left(\frac{9}{2},2\right)$ 3) $\left(\frac{9}{2},3\right)$ 4) $(9,3)$

14. **If a hyperbola passes through the point $P(10,16)$ and it has vertices at $(\pm 6,0)$, then the equation of the normal to it at P is**

1) $3x+4y=94$ 2) $x+2y=42$ 3) $2x+5y=100$ 4) $x+3y=58$

15. **if the eccentricity of the standard hyperbola passing through the point $(4,6)$ is 2, then the equation of the tangent to the hyperbola at $(4,6)B$**

1) $3x-2y=0$ 2) $x-2y+8=0$ 3) $2x-y-2=0$ 4) $2x-3y+10=0$

16. **If $5x+9=0$ is the directrix of the hyperbola $16x^2-9y^2=144$, then its corresponding focus**

1) $\left(\frac{-5}{3},0\right)$ 2) $(-5,0)$ 3) $(5,0)$ 4) $\left(\frac{5}{3},0\right)$

17. **If a hyperbola has length of its conjugate axes is equal to 5 and the distance between its foci is 13, then the eccentricity of the hyperbola is**

1) $\frac{13}{12}$ 2) 2 3) $\frac{13}{6}$ 4) $\frac{13}{8}$

18. **If the vertices of a hyperbola be at $(-2,0)$ and $(2,0)$ and one is its foci be at $(-3,0)$ then which one of the following point does not lie on the hyperbola?**

1) $(2\sqrt{6},5)$ 2) $(-6,2\sqrt{10})$ 3) $(6,5\sqrt{2})$ 4) $(4,\sqrt{15})$

19. **Tangents are drawn to the hyperbola $4x^2-y^2=36$ at the points P and Q . If these tangents intersect at the point $P(0,3)$, then the area of ΔPTQ (in sq. Units) is**

1) $36\sqrt{5}$ 2) $45\sqrt{5}$ 3) $54\sqrt{3}$ 4) $60\sqrt{3}$

20. **A normal to the hyperbola $4x^2-9y^2=36$ meets the co-ordinate axis x and y at A and B respectively. If the parallelogram $OABP$ (O being the origin) is formed, then the locus of P is**

1) $9x^2+4y^2=169$ 2) $4x^2+9y^2=121$ 3) $4x^2+9y^2=121$ 4) $9x^2-4y^2=169$

21. **The value $20m^2$ for which $y=mx+6$ is a tangent to the hyperbola $\frac{x^2}{100}-\frac{y^2}{49}=1$**

22. **If the line $y=mx+c$ is a common tangent to the hyperbola $\frac{x^2}{100}-\frac{y^2}{64}=1$ and the circle $x^2+y^2=36$ then the value of $4c^2=$**

23. **A line parallel to the straight line $2x-y=0$ is tangent to the hyperbola $\frac{x^2}{4}-\frac{y^2}{2}=1$ at the point (x_1,y_1), then $x_1^2+5y_1^2=$**

24. **If e_1 and e_2 are the eccentricities of the ellipse $\frac{x^2}{18}+\frac{y^2}{4}=1$ and hyperbola $\frac{x^2}{9}-\frac{y^2}{4}=1$ respectively and (e_1,e_2) is a point on the ellipse, $15x^2+3y^2=k$, then k=**

25. **If directrix of a hyperbola centred at the origin and passing through the point** $\left(4,-2\sqrt{3}\right)$ **is** $5x=4\sqrt{5}$ **and its eccentricity is e, then the value of** $24e^2-4e^4$ **is equal to**

26. **Let a and b be the semi-transverse and semi-conjugate axes of a hyperbola whose eccentricity satisfies the equation** $9e^2-18e+5=0$ **If** $S\left(5,0\right)$ **is focus and** $5x=9$ **is the corresponding directrix of the hyperbola, then** a^2-b^2 **is equal to**

27. **The foci of the ellipse** $\frac{x^2}{16}+\frac{y^2}{b^2}=1$ **and the hyperbola** $\frac{x^2}{144}-\frac{y^2}{81}=\frac{1}{25}$ **coincide, then the value of** b^2 **is**

28. **A tangent drawn to the hyperbola** $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ **at** $P\left(\barwedge/6\right)$ **forms a triangle of area** $3a^2Sq$ **Units with the co-ordinate axis then the square of its eccentricity is**

29. **The locus of the point of intersection of the lines** $\sqrt{3x}-y-4\sqrt{3}t=0$ **and** $\sqrt{3}tx+ty-4\sqrt{3}=0$ **(where t is a parameter) is a hyperbola whose eccentricity is**

30. **Let any double ordinate** PNP^1 **of the hyperbola** $\frac{x^2}{25}-\frac{y^2}{16}=1$ **be produced on both sides to meets the asymptotes in Q and** Q^1 **,then** $PQ\square P^1Q=$