



# MATHS

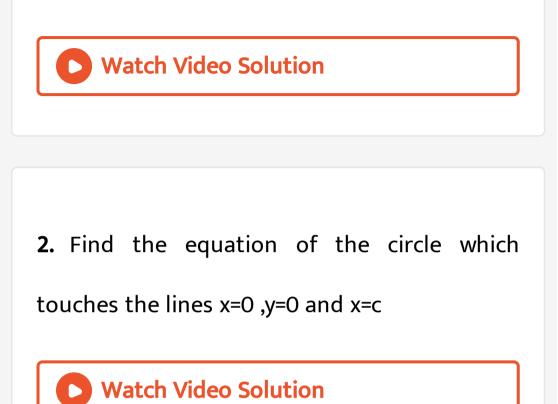
# **BOOKS - MAHAVEER PUBLICATION**

# CO-ORDINATE GEOMETRY OF TWO DIMENSIONS (CONIC SECTION)

**Question Bank** 

**1.** Find the equation of the circle passing through the three

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Points (0,0) ,(a,0) and (0,b).
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3. Two lines 2x-3y=5 and 3x-4y=7 are diameters

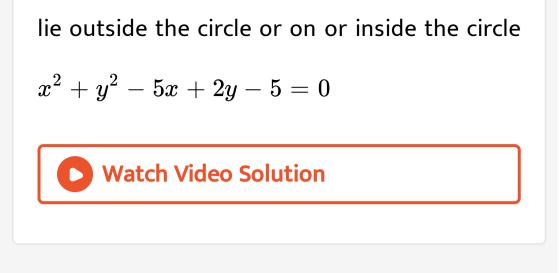
of a circle of area 154 sq units. Then find the equation of the circle.



**4.** Find the equation of the circle which passes through the points (1, -2), (4, -3) and whose center lies on the line 3x + 4y = 7.



**5.** Without drawing the figure determine whether the points (0,0),(-2,1),(4,-3),(2,6),(0,-1)



6. Find the equation of the tangent at the point (0,2) to the circle  $x^2 + y^2 - 4x + 2y - 8 = 0$ 

7. Prove that the tangents from the point (0,5) to the two circles  $x^2 + y^2 + 2x - 4 = 0$  and  $x^2 + y^2 - 6x - 4y + 16 = 0$  are of equal length.

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**8.** Find the equation of the circle which is such that the lengths of the tangents to it from the points (1,0),(0,2) and (3,2) are  $1,\sqrt{7}$  and  $\sqrt{2}$  respectively.



9. Find the equations to the common tangents of the circles  $x^2 + y^2 - 2x - 6y + 9 = 0$  and  $x^2 + y^2 + 6x - 2y + 1 = 0$ Watch Video Solution

10. Find the equation of the normal to the circle  $x^2+y^2=25$  At the point (4,3)

**11.** Find the equation of the normal to the circle  $x^2 + y^2 = 25$  from the point (5"6)

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12. Find the equation of the normal to the circle  $x^2+y^2=25$  of slope =3



**13.** Find the equation of the normal to the circle  $x^2 + y^2 - 6x - 8y = 0$  At the point(6,8)

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14. Find the equation of the normal to the circle  $x^2 + y^2 - 6x - 8y = 0$  from the point(1,6)

15. Find the equation of the normal to the circle  $x^2 + y^2 - 6x - 8y = 0$  of slope =4

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16. The length of the diameter of the circle $x^2 + y^2 - 4x - 6y + 4 = 0$  is -

A. 9

B. 3

C. 4

D. 6

#### Answer: D

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# **17.** Which of the following is the equation of circle

A. 
$$x^2 + 2y^2 - x + 6 = 0$$

B.  $x^2 - y^2 + x + y + 1 = 0$ 

 $\mathsf{C}.\, x^2 + y^2 + xy + 1 = 0$ 

D. 
$$3(x^2+y^2)+5x+1=0$$

#### Answer: D

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**18.** The equation of the circle passing through (3,6) and whose centre (2,-2) is

A. 
$$x^2 + y^2 - 4x + 2y = 45$$

B. 
$$x^2 + y^2 - 4x + 4y = 57$$

C. 
$$x^2 + y^2 + 4x - 2y = 45$$

D. 
$$x^2 + y^2 - 4x + 2y + 45 = 0$$

Answer: A

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**19.** If (4,3) and (-12,-1) are the end points of a diameter of a circle then the equation of the circle is

A. 
$$x^2 + y^2 - 8x - 2y - 51 = 0$$

B.  $x^2 + y^2 + 8x - 2y - 51 = 0$ 

C.  $x^2 + y^2 + 8x + 2y - 51 = 0$ 

D. none of these

#### **Answer: B**



### 20. The radius of the circle passing through

the points (0,0),(1,0)and(0,1) is

A. 2

$$\mathsf{B.} \frac{1}{\sqrt{2}}$$

C.  $\sqrt{2}$ D.  $\frac{1}{2}$ 

#### Answer: B



21. The radius of a circle with centre (a, b) and passing through the centre of the circle  $x^2 + y^2 - 2gx + f^2 = 0$  is -

A. 
$$\sqrt{\left(a-g
ight)^2+b^2}$$

B. 
$$\sqrt{a^2 + (b+g)^2}$$
  
C.  $\sqrt{a^2 + (b-g)^2}$   
D.  $\sqrt{(a+g)^2 + b^2}$ 

#### Answer: A



**22.** If (x, 3) and (3,5) are the extremities of a diameter of a circle with centre at (2, y), then the value of x and y are

A. x=1,y=4

B. x=4,y=1

C. x=8 , y=2

D. none of these

Answer: A

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**23.** If (0,1) and (1,1) are ends points of a diameter of a circle then its equation is

A. 
$$x^2 + y^2 - x - 2y + 1 = 0$$

B. 
$$x^2 + y^2 + x - 2y + 1 = 0$$

C. 
$$x^2 + y^2 - x - 2y - 1 = 0$$

D. none of these

#### Answer: A



24. The co-ordinates of any point on the circle

$$x^2+y^2=4$$
 are

A.  $(\cos \alpha, \sin \alpha)$ 

- $\mathsf{B.}\left(4\cos\alpha, 4\sin\alpha\right)$
- $\mathsf{C}.\left(2\cos\alpha,2\sin\alpha\right)$
- D.  $(\sin \alpha, \cos \alpha)$

#### Answer: C



25. The parametric coordinates of a point on the circle  $x^2 + y^2 - 2x + 2y - 2 = 0$  are

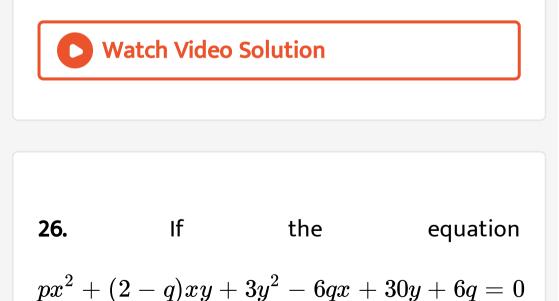
A.  $(1-2\coslpha,1-2\sinlpha)$ 

 $\mathsf{B.}\left(1+2\cos\alpha,1+2\sin\alpha\right)$ 

 $\mathsf{C}.\left(1+2\cos\alpha,\ -1+2\sin\alpha\right)$ 

D.  $(-1+2\coslpha,1+2\sinlpha)$ 

#### Answer: C



represents a circle, then find the values of pandq.

- A. 2,2
- B. 3,1
- C. 3,2
- D. 3,4

#### Answer: C



27. The circle represented by the equation  $x^2+y^2+2gx+2fy+c=0$  will be a point circle, if

A. 
$$g^2+f^2=C$$
  
B.  $g^2+f^2+c=0$   
C.  $q^2+f^2>c$ 

D. none of these

#### Answer: A

**28.** The point where the line x=0 touches the circle  $x^2 + y^2 - 2x - 6y + 9 = 0$  is

A. (0,1)

B. (0,2)

C. (0,3)

D. no where

Answer: C

**29.** Position of the point (1,1) with respect to the circle  $x^2 + y^2 - x + y - 1 = 0$  is

A. outside the circle

B. inside the circle

C. upon the circle

D. none of these

**Answer: A** 

**30.** The equation to a circle with centre(2,1) and touching x axis is

A. 
$$x^2 + y^2 + 4x + 2y + 4 = 0$$
  
B.  $x^2 + y^2 - 4x - 2y + 4 = 0$   
C.  $x^2 + y^2 - 4x - 2y + 1 = 0$ 

D. none of these

#### **Answer: B**

**31.** The circle  $x^2 + y^2 - 4x - 4y + 4 = 0$  is

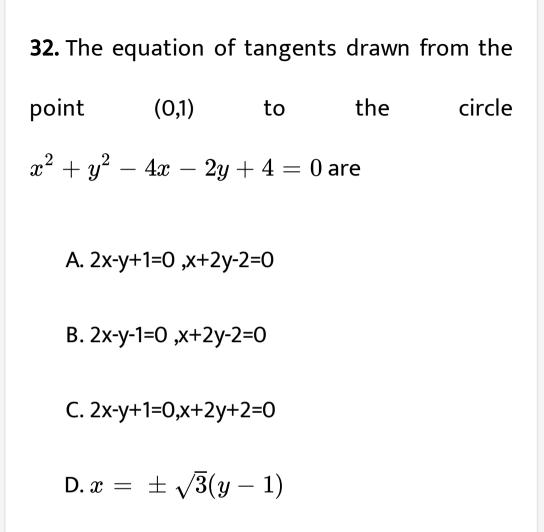
A. touches x axis only

B. touches both axis

C. passes through the origin

D. touches y axis only

Answer: B



#### Answer: A

**33.** If y=c is a tangent to the circle  $x^2 + y^2 - 2x + 2y - 2 = 0$  at (1, 1), then the value of c is

A. 1

B. 2

C. -1

D. -2

#### Answer: A



34. The equation of the normal to the circle

$$x^2+y^2=9$$
 at the point  $\left(rac{1}{\sqrt{2}},rac{1}{\sqrt{2}}
ight)$  is

A. 
$$x-y=rac{\sqrt{2}}{3}$$

B. x+y=0

#### Answer: C



**35.** The equation of the normal at the point (4,-1) of the circle  $x^2 + y^2 - 40x + 10y = 153$  is

- A. x+4y=0
- B. 4x+y=3
- C. x-4y=0
- D. 4x-y=0

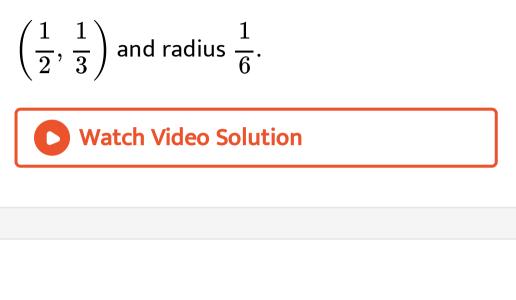
#### **Answer: A**



36. Find the equation of the circle with centre(1,2) and radius 2Watch Video Solution

**37.** Find the equation of the circle with centre(-2,1) and radius 3

38. Find the equation of the circle with center



**39.** Find the equation of the circle with centre(-1,-3) and radius  $\sqrt{3}$ 

**40.** Find the equation of the circle with centre(h,k) and radius  $\sqrt{h^2+k^2}$ 

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**41.** Find the centre and the radius of the given circles.  $(x + 1)^2 + (y - 2)^2 = 9$ 

42. Find the centre and radius of the circle  $(x+2)^2 + (y+3)^2 = 5$ Watch Video Solution

43. Find the centre and the radius of the circle

$$x^2 + y^2 + 8x + 10y - 8 = 0.$$

44. Find the centre and radius of the circles

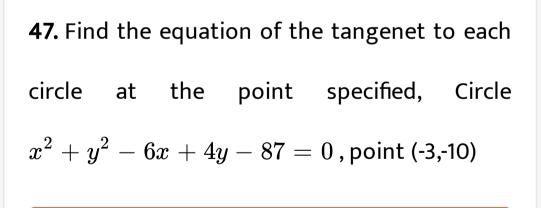
$$2x^2 + 2y^2 - x = 0$$

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**45.** Find the equation of the tangenet to each circle at the point specified, Circle  $x^2 + y^2 - 2x - 4y - 20 = 0$ , point (4,-2)

**46.** Find the equation of the tangenet to each circle at the point specified, Circle  $x^2 + y^2 + 4x + 2y - 20 = 0$ , point (1,3)





**48.** Find the equation of the circle passing through the points (4, 1) and (6, 5) and whose centre is on the line 4x + y = 16.

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**49.** Find the equation of the circle passing through the points (2, 3) and (1, 1) and whose centre is on the line  $x \quad 3y \quad 11 = 0$ .

50. Find the equation of the circle with radius

5 whose centre lies on xaxis and passes through the point (2, 3).



**51.** Find the equation of the circle passing through (0, 0) and making intercepts a and b

on the coordinate axes.



52. Find the equation of a circle with centre (2,

2) and passes through the point (4, 5).



53. Does the point (-2,4) lie inside . Outside or

on the circle  $x^2+y^2=25$ 

54. The square of the length of tangent from

(3, –4) on the circle  $x^2 + y^2 - 4x - 6y + 3 = 0$ 

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55. If the circles  $x^2 + y^2 + 2x - 8y + 8 = 0$ and  $x^2 + y^2 + 10x - 2y + 22 = 0$  touch each other find their point of contact

**56.** If the lines 2x-3y+1=0 and 3x+y-4=0 lie along

diameters of a circle of circumference is  $10\pi$  .

Then find the equation of the circle.

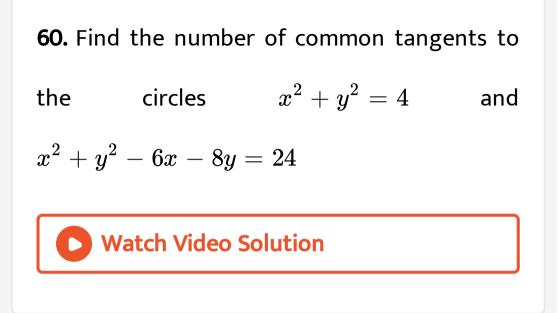


57. If the lines 3x - 4y - 7 = 0 and 2x - 3y - 5 = 0 are two diameters of a circle of area  $49\pi$  square units, the equation of the circle is:

**58.** The equation of the circle passing through the point (1, 0) and (0, 1) and having the smallest radius is

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**59.** The centre of a circle passing through the points (0, 0), (1, 0) and touching the circle  $x^2 + y^2 = 9$ , is



**61.** Find the points of intersection of the line y=2x+1 and the circle  $x^2 + y^2 - 2y = 0$ . Find the equation of the tangent to the circle at one of the point of intersection.

62. Find the points of intersection of the line

x+y=3 and the circle

 $x^2+y^2-2x-2y+1=0$  what are the

tangents at the point of intersection?

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63. Find the points where the circle  $x^2 + y^2 - 10x - 10y + 40 = 0$  and the line y+2x=10 intersect.Find the equation of the

tangent to the circle at each of the points of

intersection.



64. For each of that parabolas, find the coordinates of the focus, the equation of the directrix and the length of latus rectum :  $y^2 = 12x$ 

**65.** Find the co-ordinate of the focus, axis, equation of the directrix and latus rectum of the parabola  $x^2 = -4y$ 



**66.** Find the equation of the parabola with focus (2, 0) and directrix x = -2.

67. Find the equation of the parabola which is

symmetric about the X-axis, centered at origin

and passes through the point(4,-6).



**68.** 
$$\frac{x^2}{16} + \frac{y^2}{9} = 1$$

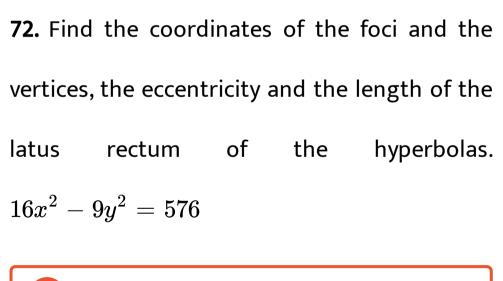
**69.** Find the equation of the ellipse whose vertices are  $(\pm 6, 0)$  and foci are  $(\pm 4, 0)$ .

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70. Find the equation of the ellipse,whose length of the major axis is 10 and foci are  $(0,\ \pm\ 2).$ 

**71.** Find the equation of the ellipse which passes through the points (2,0) and (0,1).





73. The equation of the hyperbola with foci  $(0, \pm 5)$  and vertices  $(0, \pm 3)$  is Watch Video Solution

74. Find the equation of the hyperbola where foci are  $(0, \pm 12)$ and the length of the latus rectum is 36.

**75.** The focus of the parabola  $y^2 = 16x$  is

A. (2,0)

B. (3,0)

C. (4,0)

D. (6,0)

Answer: C

**76.** The length of the latus rectum of the parabola  $y^2 = 8x$  is

A. 4

B. 6

C. 8

D. 10

### Answer: A

**77.** Find the equation of the parabola with focus (2, 0) and directrix x = -2.

A. 
$$y^2=8x$$

$$\mathsf{B.}\,y^2=6x$$

D. 
$$y^2=10x$$

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### Answer: A

**78.** The equation of the parabola passes through the parabola (1,1) and (2,4)

A. 
$$y^2=x$$

$$\mathsf{B.}\,x^2=y$$

$$\mathsf{C.}\,x^2 = 4y$$

D. 
$$y^2 = 4x$$

### **Answer: B**

79. The coordinate of foci of the ellipse  $rac{x^2}{25} + rac{y^2}{9} = 1$  is

A. (-4,0) and (4,0)

B. (-3,0) and (3,0)

C. (-9,0) and(9,0)

D. (-5,0) and (5,0)

### Answer: A

**80.** Eccentricity of the ellipse  $rac{x^2}{25}+rac{y^2}{9}=1$  is

A. 
$$\frac{4}{5}$$
  
B.  $\frac{5}{4}$   
C.  $\frac{3}{5}$   
D.  $\frac{4}{9}$ 

Answer: C



81. The length of the major axis of the ellipse is

$$9x^2 + 4y^2 = 36$$

A. 2

B.4

C. 6

D. 8

### Answer: C

82. The equation of the ellipse passes through

the points (4,0) and (0,2) is

A. 
$$rac{x^2}{4} + rac{y^2}{16} = 1$$
  
B.  $rac{x^2}{16} + rac{y^2}{4} = 1$   
C.  $rac{x^2}{4} + rac{y^2}{2} = 1$   
D.  $rac{x^2}{2} + rac{y^2}{4} = 1$ 

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### Answer: B

83. The coordinate of foci of the hyperbola

$$rac{x^2}{9} - rac{y^2}{16} = 1$$
 is

A. 
$$(~\pm 4, 0)$$

- $\texttt{B.}\,(\,\pm\,5,\,0)$
- $\mathsf{C.}\,(\,\pm\,6,\,0)$

D. 
$$(~\pm~3,0)$$

### Answer: D

**84.** Find the length of the axes , the coordinates of the vertices and the foci, the eccentricity and length of the latus rectum of the hyperbola

$$y^2 - 16x^2 = 16.$$

A. 
$$\frac{\sqrt{17}}{4}$$
 and  $\frac{1}{2}$   
B.  $\frac{\sqrt{17}}{2}$  and  $\frac{1}{4}$   
C.  $\frac{\sqrt{17}}{4}$  and  $\frac{1}{4}$   
D.  $\frac{\sqrt{17}}{8}$ 

### Answer: D





85. Find the coordinates of the focus, axis of the parabola, the equation of the directrix and the length of the latus rectum. $x^2 = 6y$ 

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86. Find the coordinates of the focus,axis of the parabola, the equation of the directrix and length of the latus rectum  $y^2 = -8x$ 



87. Vertex (0, 0) passing through (2,3) and axis

is along x-axis.

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88. Find the equation of the parabola with

vertex (0,0) and focus (3,0).

89. Find the equation of the parabola with

focus F(0,-3) and directrix y=3.

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**90.** Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse  $\frac{x^2}{4} + \frac{y^2}{16} = 1$ 

**91.** Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse  $\frac{x^2}{16} + \frac{y^2}{9} = 1$ 

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92. The equation of the ellipse whose vertices

are  $(\ \pm\ 5, 0)$  and foci at  $(\ \pm\ 4, 0)$  is

**93.** Find the equation of the ellipse in the following case: ends of major axis  $(\pm 3, 0)$  ends of minor axis  $(0, \pm 2)$ 

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**94.** Find the equation of the ellipse having, length of major axis 26 and foci  $(\pm 5, 0)$ 

**95.** Find the coordinates of the foci and the vertices, the eccentricity and the length of the latus rectum of the hyperbolas.  $9y^2 - 4x^2 = 36$ 

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**96.** Find the coordinates of the foci and the vertices, the eccentricity and the length of the latus rectum of the hyperbolas.  $\frac{x^2}{16} - \frac{y^2}{9} = 1$ 

**97.** Find the equation of the hyperbola having : vertices  $(0, \pm 3)$  and  $foci(0, \pm 5)$ .

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98. Find the equations of the hyperbola satisfying the given conditions :Foci  $(\pm 4, 0)$ , the latus rectum is of length 12

**99.** Find the equations of the hyperbola satisfying the given conditions :Foci (  $\pm$  5, 0), the transverse axis is of length 8.

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100. Find the equations of the hyperbola satisfying the given conditions :Foci  $(0, \pm 13)$ 

, the conjugate axis is of length 24.

101. Find the eccentricity and length of the latus rectum of the ellipse  $x^2 + 2y^2 = 3$ 

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102. What are the lengths of major axis and minor of the ellipse  $9x^2 + 16y^2 = 144$ 

103. Find the coordinates of the centre, vertices, foci and the equation of the directrices of the hyperbola  $9x^2 - 16y^2 = 144$ 



**104.** The parabola  $y^2 = 4$  px passes through are point (1,2). Find the co-ordinate of focus, length of latus rectum and equation of directrix of the parabola.



105. Find the coordinates of foci, equation of

directrices of the ellipse 
$$\displaystyle rac{x^2}{9} + \displaystyle rac{y^2}{4} = 1$$

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# 106. Find the equation of the parabola with

focus at (1,-3) and the directrix x-2y+3=0.



**107.** Find the co-ordinate of focus and the equation of the directrix of the parabola  $y^2 = 4ax$ , if it passes through the point(3,-2).



# **108.** Find the vertex, focus, length of the latus rectum , equation of directrix of the parabola $3y^2 = 5x$ .

109. If the eccentricities of the ellipses

$$rac{x^2}{lpha^2}+~\mid rac{y^2}{eta^2}=1$$
 and  $rac{x^2}{a^2}+rac{y^2}{b^2}=1$  be same

show that aeta=blpha

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110. Find the length of latus rectum, equation of directrices of the ellipse  $12x^2 + 9y^2 = 144$ .