



## MATHS

### BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

## ELLIPSE

### Solved Examples

1. The centre of the ellipse  $\frac{(2x - 3y - 1)^2}{16} + \frac{(3x + 2y - 8)^2}{9} = 1$  is

- A. (1, 1)
- B. (1, -2)
- C. (2, 1)
- D. (2, -1)

**Answer: C**





Watch Video Solution

2. If the length of the major axis of an ellipse is four times the length of its minor axis, then its eccentricity is

A.  $1/3$

B.  $\sqrt{15}/4$

C.  $1/\sqrt{2}$

D.  $2\sqrt{2}/3$

**Answer: B**



Watch Video Solution

3. If the minor axis of an ellipse subtends an angle  $90^\circ$  at each focus then the eccentricity of the ellipse is

A.  $\sqrt{3}/2$

B.  $1/\sqrt{2}$

C.  $2/\sqrt{3}$

D. none

**Answer: B**



**Watch Video Solution**

4. The pole of the line  $2x - y + 2 = 0$  w.r.t the ellipse  $3x^2 + 5y^2 = 15$  is

A.  $(-5/3, 2)$

B.  $(9/2, 2)$

C.  $(6, 6)$

D.  $(-5, 3/2)$

**Answer: D**



**Watch Video Solution**

5. Area of the quadrilateral formed by the extremities of major axis and minor axis is  $8\sqrt{3}$ . The distance between foci is  $4\sqrt{2}$ . Then eccentricity of the ellipse is

A.  $\frac{1}{\sqrt{3}}$

B.  $\frac{1}{3}$

C.  $\frac{\sqrt{2}}{3}$

D.  $\frac{2}{3}$

**Answer: C**



**Watch Video Solution**

6. The normal at a point P on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 (a > b)$  meets the axis in M and N so that  $\frac{PM}{PN} = \frac{2}{3}$ . Then the value of eccentricity is

A.  $1 - e^2$

B.  $e^2 - 1$

C.  $1 + e^2$

D.  $e^2$

**Answer: A**



**Watch Video Solution**

7. Tangents are drawn to the ellipse  $\frac{x^2}{9} + \frac{y^2}{5} = 1$  at the ends of latus rectum. The area of the quadrilateral formed, is

A.  $27/55$

B.  $27/4$

C.  $27/2$

D.  $27$

**Answer: D**



**Watch Video Solution**

8. The normal at a point P on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 (a > b)$  meets the axis in M and N so that  $\frac{PM}{PN} = \frac{2}{3}$ . Then the value of eccentricity is

A.  $\frac{1}{\sqrt{2}}$

B.  $\frac{\sqrt{7}}{2}$

C.  $\frac{1}{\sqrt{3}}$

D.  $\frac{2}{3}$

**Answer: C**



**Watch Video Solution**

9. If  $\alpha, \beta$  are the eccentric angles of the extremities of a focal chord of the ellipse  $\frac{x^2}{16} + \frac{y^2}{9} = 1$ , then  $\tan \frac{\alpha}{2} \tan \frac{\beta}{2} =$

A.  $\frac{\sqrt{5} + 4}{\sqrt{5} - 4}$

B.  $\frac{9}{23}$

C.  $\frac{\sqrt{5} - 4}{\sqrt{5} + 4}$

D.  $\frac{8\sqrt{7} - 23}{9}$

**Answer: D**



[View Text Solution](#)

## Exercise 1 A

1. An ellipse with the eccentricity  $e = 1/2$  has a focus at  $(0, 0)$  and the corresponding directrix is  $x+6=0$ . The equation of the ellipse is

A.  $3x^2 + 4y^2 + 12x - 36 = 0$

B.  $3x^2 + 4y^2 - 12x + 36 = 0$

C.  $3x^2 + 4y^2 - 12x - 36 = 0$

D. none

**Answer:**



[Watch Video Solution](#)

2. The equation of the ellipse whose focus is at (4,0) and whose eccentricity is  $\frac{4}{5}$  is

A.  $\frac{x^2}{3^2} + \frac{y^2}{5^2} = 1$

B.  $\frac{x^2}{5^2} + \frac{y^2}{3^2} = 1$

C.  $\frac{x^2}{5^2} + \frac{y^2}{4^2} = 1$

D.  $\frac{x^2}{4^2} + \frac{y^2}{5^2} = 1$

**Answer:**



[Watch Video Solution](#)

3. The equation of the ellipse whose focus is (3, -2), eccentricity  $\frac{3}{4}$  and directrix  $2x - y + 3 = 0$

A.  $14x^2 + 33xy + 17y^2 - 255x + 74y + 159 = 0$

B.  $44x^2 + 36xy + 71y^2 - 588x + 374y + 959 = 0$

C.  $4x^2 + 56xy + 271y^2 - 188x + 274y + 359 = 0$



$$D. 44x^2 - 36xy - 71y^2 - 588x - 374y - 959 = 0$$

**Answer:**



**Watch Video Solution**

4. The equation of ellipse whose focus is

$$\left(0, \sqrt{a^2 - b^2}\right), \text{ directrix is } y = \frac{a^2}{\sqrt{a^2 - b^2}} \text{ and eccentricity is } \frac{\sqrt{a^2 - b^2}}{a}$$

is

A.  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

B.  $\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$

C.  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 2$

D.  $\frac{x^2}{b^2} + \frac{y^2}{a^2} = 2$

**Answer:**



**Watch Video Solution**

5. The equation of the ellipse whose foci are  $(\pm 3, 0)$  and eccentricity  $3/4$

is

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

B.  $\frac{x^2}{16} + \frac{y^2}{7} = 1$

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

D.  $\frac{x^2}{7} + \frac{y^2}{16} = 1$

**Answer:**



[Watch Video Solution](#)

6. The equation of the ellipse whose vertices are  $(2, 5)$ ,  $(2, -1)$  and

eccentricity  $\sqrt{5}/3$  is

A.  $\frac{(x - 2)^2}{4} + \frac{(y - 2)^2}{9} = 1$

B.  $\frac{(x - 2)^2}{36} + \frac{(y - 3)^2}{16} = 1$

C.  $\frac{(x + 2)^2}{16} + \frac{(y - 3)^2}{36} = 1$

$$D. \frac{(x+2)^2}{36} + \frac{(y+3)^2}{16} = 1$$

**Answer:**



[Watch Video Solution](#)

7. The equation of the ellipse whose centre is (5, 2) vertex is (9, 2), the length of the major axis is 8 and minor axis 6 is

$$A. \frac{(x-5)^2}{16} + \frac{(y-2)^2}{9} = 1$$

$$B. \frac{(x+5)^2}{26} + \frac{(y+2)^2}{19} = 1$$

$$C. \frac{(2x-5)^2}{16} + \frac{(6y-12)^2}{19} = 1$$

$$D. \frac{(x-3)^2}{45} - \frac{(y-2)^2}{9} = 1$$

**Answer:**



[Watch Video Solution](#)

8. The equation of the ellipse with its major axis is x-axis, minor axis is y-axis, eccentricity is  $\frac{2}{3}$  and the length of major axis is 12 is

A.  $\frac{x^2}{36} + \frac{y^2}{20} = 1$

B.  $\frac{x^2}{36} + \frac{y^2}{16} = 1$

C.  $\frac{x^2}{36} + \frac{y^2}{25} = 1$

D.  $\frac{x^2}{36} + \frac{y^2}{30} = 1$

**Answer:**



[Watch Video Solution](#)

9. The equation of the ellipse with its axes as the coordinate axes respectively and whose latus rectum = 8 and eccentricity =  $\frac{1}{\sqrt{2}}$  is

A.  $\frac{x^2}{64} + \frac{y^2}{32} = 1$

B.  $\frac{x^2}{9} + \frac{y^2}{4} = 1$

C.  $\frac{x^2}{9} + \frac{y^2}{5} = 1$

$$D. \frac{x^2}{12} + \frac{y^2}{9} = 1$$

**Answer:**



[Watch Video Solution](#)

10. The equation of the ellipse with its axes as the coordinate axes respectively and whose minor axis = 6 and eccentricity =  $1/2$  is

$$A. \frac{x^2}{64} + \frac{y^2}{32} = 1$$

$$B. \frac{x^2}{9} + \frac{y^2}{4} = 1$$

$$C. \frac{x^2}{9} + \frac{y^2}{5} = 1$$

$$D. \frac{x^2}{12} + \frac{y^2}{9} = 1$$

**Answer:**



[Watch Video Solution](#)

11. The equation of the ellipse with its axes as the coordinate axes respectively, the length of latus rectum is 15 and distance between the foci 10 is

A.  $\frac{x^2}{100} + \frac{y^2}{75} = 1$

B.  $\frac{x^2}{75} + \frac{y^2}{100} = 1$

C.  $\frac{x^2}{50} + \frac{y^2}{25} = 1$

D.  $\frac{x^2}{25} + \frac{y^2}{50} = 1$

**Answer:**



[Watch Video Solution](#)

12. The equation of the ellipse with its axes as the coordinate axes and whose latus rectum is 10 and distance between the foci = minor axis is

A.  $x^2 + 2y^2 = 16$

B.  $x^2 + 2y^2 = 32$

C.  $x^2 + 2y^2 = 64$

D.  $x^2 + 2y^2 = 100$

**Answer:**



[Watch Video Solution](#)

13. The equation of the ellipse referred to its axes as coordinate axes, which passes through the points (2, 2) and (1, 4) is

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

B.  $4x^2 + y^2 = 8$

C.  $4x^2 + y^2 = 16$

D.  $4x^2 + y^2 = 20$

**Answer:**



[Watch Video Solution](#)

14. The equation of the ellipse with its major axis is parallel to x-axis, centre is (1, -1), eccentricity is  $\frac{5}{6}$  and the length of major axis is 12 is

A.  $\frac{(x + 1)^2}{36} + \frac{(y - 1)^2}{11} = 1$

B.  $\frac{(x - 1)^2}{36} + \frac{(y + 1)^2}{11} = 1$

C.  $\frac{(x + 1)^2}{11} + \frac{(y - 1)^2}{36} = 1$

D.  $\frac{(x - 1)^2}{11} + \frac{(y + 1)^2}{36} = 1$

**Answer:**



[Watch Video Solution](#)

15. An ellipse drawn by taking a diameter of the circle  $(x - 1)^2 + y^2 = 1$  as its semiminor axis and a diameter of the circle  $x^2 + (y - 2)^2 = 4$  as its semi-major axis. If the centre of the ellipse is at the origin and its axes are the coordinate axes, then the equation of the ellipse is

A.  $4x^2 + y^2 = 8$



B.  $x^2 + 4y^2 = 16$

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

D.  $x^2 + 4y^2 = 8$

**Answer:**



[Watch Video Solution](#)

**16.** The eccentricity of an ellipse, with its centre at the origin, is  $1/2$ . If one of the directrices is  $x = 4$ , then the equation of the ellipse is

A.  $3x^2 + 4y^2 = 1$

B.  $4x^2 + 3y^2 = 1$

C.  $4x^2 + 3y^2 = 12$

D.  $3x^2 + 4y^2 = 12$

**Answer:**



[Watch Video Solution](#)

17. The equation of the ellipse whose vertices are  $(-4, 1)$ ,  $(6, 1)$  and one latus rectum is  $x - 4 = 0$  is

A.  $\frac{(x - 1)^2}{25} + \frac{(y - 1)^2}{16} = 1$

B.  $\frac{(x - 1)^2}{16} + \frac{(y - 1)^2}{25} = 1$

C.  $\frac{(x + 1)^2}{25} + \frac{(y + 1)^2}{16} = 1$

D.  $\frac{(x + 1)^2}{16} + \frac{(y + 1)^2}{25} = 1$

**Answer:**



**Watch Video Solution**

18. The equation of the ellipse whose focus is  $(2, 4)$ , centre is  $(3, 4)$  and eccentricity is  $1/2$  is

A.  $\frac{(x - 3)^2}{6} + \frac{(y - 4)^2}{8} = 1$

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

$$C. \frac{(x + 3)^2}{6} + \frac{(y + 4)^2}{8} = 1$$

$$D. \frac{(x + 3)^2}{8} + \frac{(y + 4)^2}{6} = 1$$

**Answer:**



**Watch Video Solution**

**19.** The equation of the ellipse with its focus at (6, 2), centre at (1, 2) and which passes through the point (4, 6) is

$$A. (x - 1)^2 / 25 + (y - 2)^2 / 16 = 1$$

$$B. (x - 1)^2 / 25 + (y - 2)^2 / 20 = 1$$

$$C. (x - 1)^2 / 45 + (y - 2)^2 / 16 = 1$$

$$D. (x - 1)^2 / 45 + (y - 2)^2 / 20 = 1$$

**Answer:**



**Watch Video Solution**

20. The centre is (2, -3), focus (3, -3) and the vertex is at (4, -3). The equation of the ellipse is

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

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

C.  $\frac{(x - 2)^2}{8} + \frac{(y + 3)^2}{6} = 1$

D. none

**Answer:**



[Watch Video Solution](#)

21. The ellipse  $x^2 + 4y^2 = 4$  is inscribed in a rectangle aligned with the coordinate axes, which in turn is inscribed in another ellipse that passes through the point (4, 0). Then the equation of the ellipse is

A.  $x^2 + 12y^2 = 16$

B.  $4x^2 + 48y^2 = 48$

$$C. 4x^2 + 64y^2 = 48$$

$$D. x^2 + 16y^2 = 16$$

**Answer:**



**Watch Video Solution**

22. The equation of the ellipse whose vertices are  $(4, 1)$ ,  $(6, 1)$  whose focus lies on the line  $x - 2y = 2$  is

$$A. \frac{(x - 1)^2}{25} + \frac{(y - 1)^2}{16} = 1$$

$$B. \frac{(x - 1)^2}{16} + \frac{(y - 1)^2}{25} = 1$$

$$C. \frac{(x + 1)^2}{25} + \frac{(y + 1)^2}{16} = 1$$

$$D. \frac{(x + 1)^2}{16} + \frac{(y + 1)^2}{25} = 1$$

**Answer:**



**Watch Video Solution**

23. Equation of the ellipse whose axes are the axes of coordinates and which passes through the point  $(-3, 1)$  and has eccentricity  $\sqrt{2/5}$  is :

A.  $3x^2 + 5y^2 - 15 = 0$

B.  $5x^2 + 3y^2 - 32 = 0$

C.  $3x^2 + 5y^2 - 32 = 0$

D.  $5x^2 + 3y^2 - 48 = 0$

**Answer:**



[Watch Video Solution](#)

24. The centre of the ellipse  $4x^2 + 9y^2 - 24x + 36y - 72 = 0$  is

A.  $(3, -2)$

B.  $(2, -1)$

C.  $(3, 5)$

D.  $(5, 3)$

**Answer:**



**Watch Video Solution**

25. The centre of the ellipse  $\frac{(x + y - 2)^2}{9} + \frac{(x - y)^2}{16} = 1$  is

A. (0, 0)

B. (1, 1)

C. (1, 0)

D. (0, 1)

**Answer:**



**Watch Video Solution**

26. The centre of the ellipse  $\frac{(x + y - 3)^2}{9} + \frac{(x - y + 1)^2}{16} = 1$  is

A. (-1, 2)

B. (1, -2)

C. (-1, -2)

D. (1, 2)

**Answer:**



[Watch Video Solution](#)

27. The vertices of the ellipse  $4x^2 + 9y^2 - 24x + 36y - 72 = 0$  are

A. (9, -2), (-3, -2)

B. (7, -1), (-3, -1)

C. (3, 0), (3, 10)

D. (8, 6), (-7, 5)

**Answer:**



[Watch Video Solution](#)



28. The vertices of the ellipse  $4x^2 + 9y^2 - 24x + 36y - 72 = 0$  are

A. (9, -2), (-3, -2)

B. (7, -1), (-3, -1)

C. (3, 0), (3, 10)

D. (8, 6), (-7, 5)

**Answer:**



**Watch Video Solution**

29. The foci of the ellipse  $\frac{(x - 1)^2}{5} + \frac{(y - 5)^2}{9} = 1$  is

A. (7, 5), (3, 2)

B. (4, 7), (2, 3)

C. (1, -7), (1, 3)

D. (1, 7), (1, 3)

**Answer:**



[Watch Video Solution](#)

**30.** The foci of the ellipse  $9x^2 + 25y^2 - 36x + 50y - 164 = 0$  are

- A. (6, 1), (2, -1)
- B. (6, -1), (-2, -1)
- C. (-6, -1), (-2, -1)
- D. (6, 1), (2, 1)

**Answer:**



[Watch Video Solution](#)

**31.** The length of the major axis of the ellipse  $\frac{(x - 3)^2}{4} + \frac{(y - 2)^2}{9} = 1$  is

A. 10

B. 4

C. 6

D. 8

**Answer:**



[Watch Video Solution](#)

**32.** The length of the major axis of  $3x^2 + 4y^2 + 6x - 8y - 5 = 0$  is

A. 2

B.  $\sqrt{3}$

C. 4

D.  $2\sqrt{3}$

**Answer:**



[Watch Video Solution](#)

33. The length of the minor axis of  $9x^2 + 25y^2 - 18x - 100y - 116 = 0$

is

A. 3

B. 5

C. 6

D. 10

**Answer:**



[Watch Video Solution](#)

34. In an ellipse, minor axis = 8 and eccentricity =  $\sqrt{5}/3$  then major axis =

A. 6

B. 12

C. 10

D. 16

**Answer:**



[Watch Video Solution](#)

35. A focus of an ellipse is at the origin. The directrix is the line  $x = 4$  and the eccentricity is  $\frac{1}{2}$ . Then the length of the semi - major axis is

A.  $\frac{2}{3}$

B.  $\frac{4}{3}$

C.  $\frac{5}{3}$

D.  $\frac{8}{3}$

**Answer:**



[Watch Video Solution](#)

36. The length of the latus rectum of the ellipse

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

A.  $8/3$

B.  $18/5$

C.  $9/2$

D.  $8/5$

**Answer:**



[Watch Video Solution](#)

37. The length of the latus rectum of the ellipse

$$9x^2 + 25y^2 - 18x - 100y - 116 = 0 \text{ is}$$

A.  $8/3$

B.  $18/5$

C.  $9/2$

D.  $8/5$

**Answer:**



[Watch Video Solution](#)

**38.** If the latus rectum of the ellipse  $x^2 \tan^2 \alpha + y^2 \sec^2 \alpha = 1$  is  $1/2$  then

$\alpha =$

A.  $\pi/12$

B.  $\pi/6$

C.  $5\pi/12$

D. none

**Answer:**



[Watch Video Solution](#)

39. The distance between the foci of the ellipse  $x = 3 \cos \theta, y = 4 \sin \theta$  is

A.  $2\sqrt{7}$

B.  $7\sqrt{2}$

C.  $\sqrt{7}$

D.  $3\sqrt{7}$

**Answer:**



[Watch Video Solution](#)

40. The eccentricity of the ellipse  $\frac{x^2}{9} + \frac{y^2}{16} = 1$  is

A.  $17/16$

B.  $5/4$

C.  $\sqrt{7}/4$

D.  $\sqrt{7}/2$



**Answer:**



[Watch Video Solution](#)

**41.** The eccentricity of the ellipse  $5x^2 + 9y^2 = 1$  is

A.  $2/3$

B.  $3/4$

C.  $4/5$

D.  $1/2$

**Answer:**



[Watch Video Solution](#)

**42.** The eccentricity of the ellipse  $9x^2 + 4y^2 = 36$  is

A.  $\sqrt{5}$

B. 5

C.  $5/3$

D.  $\sqrt{5}/3$

**Answer:**



[Watch Video Solution](#)

43. The eccentricity of the conic  $36x^2 + 144y^2 - 36x - 96y - 119 = 0$  is

A.  $\sqrt{3}/2$

B.  $1/2$

C.  $\sqrt{3}/4$

D.  $1/\sqrt{3}$

**Answer:**



[Watch Video Solution](#)

44. The eccentricity of the ellipse  $9x^2 + 5y^2 - 30y = 0$  is

A.  $1/3$

B.  $2/3$

C.  $3/4$

D.  $1/2$

**Answer:**



**Watch Video Solution**

45. The eccentricity of the ellipse  $x^2 + 4y^2 + 2x + 16y + 13 = 0$  is

A.  $\frac{\sqrt{3}}{2}$

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

C.  $\frac{1}{\sqrt{3}}$

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

**Answer:**



[Watch Video Solution](#)

**46.** The eccentricity of the ellipse whose latus rectum is equal to half of its minor axis is

A.  $3/5$

B.  $\frac{\sqrt{3}}{2}$

C.  $1/\sqrt{2}$

D.  $\sqrt{7}/4$

**Answer:**



[Watch Video Solution](#)

**47.** If the length of the major axis of an ellipse is three times the length of its minor axis then find the eccentricity of the ellipse.

A.  $1/3$

B.  $1/\sqrt{3}$

C.  $1/\sqrt{2}$

D.  $2\sqrt{2}/3$

**Answer:**



**Watch Video Solution**

**48.** The eccentricity of the ellipse whose major axis is double the minor axis is

A.  $1/\sqrt{3}$

B.  $2/\sqrt{3}$

C.  $\sqrt{3}/2$

D.  $\sqrt{3}/4$

**Answer:**

 [Watch Video Solution](#)

49. The latus rectum of an ellipse is  $\frac{1}{3}$  of the major axis. Its eccentricity is

A.  $\frac{2}{3}$

B.  $\sqrt{\frac{2}{3}}$

C.  $5 \times 4 \times 3 \times 7^3$

D.  $(\frac{3}{4})^3$

**Answer:**

 [Watch Video Solution](#)

50. The major axis of an ellipse is three times the minor axis, then the eccentricity is

A.  $\frac{2\sqrt{2}}{3}$

B.  $\frac{2}{3}$

C.  $\sqrt{2}/3$

D.  $1/3$

**Answer:**



[Watch Video Solution](#)

51. In an ellipse the distance between the foci is 6 and its minor axis is 8.

Then its eccentricity is

A.  $4/5$

B.  $1/\sqrt{52}$

C.  $3/5$

D.  $1/2$

**Answer: C**



[Watch Video Solution](#)

52. S and T are the foci of an ellipse and B is one end of the minor axis. If STB is an equilateral triangle, then find the eccentricity of the ellipse.

A.  $1/4$

B.  $1/3$

C.  $1/2$

D.  $2/3$

**Answer:**



[Watch Video Solution](#)

53. An ellipse has OB as semiminor axis, F and  $F'$  its foci and the angle  $FBF'$  is a right angle. Then the eccentricity of the ellipse is

A.  $1/\sqrt{2}$

B.  $1/2$

C.  $1/4$



D.  $1/\sqrt{3}$

**Answer:**



**Watch Video Solution**

54. The minor axis forms an equilateral triangle with vertex at the end of the major axis then the eccentricity of the ellipse is

A.  $1/2$

B.  $1/\sqrt{3}$

C.  $\sqrt{2/3}$

D.  $\sqrt{3/2}$

**Answer:**



**Watch Video Solution**

55. A circle is described with minor axis of an ellipse as a diameter. If the foci lie on the circle, the eccentricity of the ellipse is

A.  $1/2$

B.  $1/\sqrt{2}$

C.  $1/3$

D.  $1/\sqrt{3}$

**Answer:**



[Watch Video Solution](#)

56. The circle on  $SS'$  as diameter intersects the ellipse in real points then its eccentricity

A.  $2/\sqrt{3}$

B.  $\sqrt{3}/2$

C.  $1/\sqrt{2}$

D.  $1/\sqrt{3}$

**Answer:**



**Watch Video Solution**

57. If the minor axis of an ellipse subtends an angle  $60^\circ$  at each focus then the eccentricity of the ellipse is

A.  $\sqrt{3}/2$

B.  $1/\sqrt{2}$

C.  $2/\sqrt{3}$

D. none

**Answer:**



**Watch Video Solution**

58. The distance between the foci is equal to the minor axis of an ellipse then its eccentricity is

A.  $1/\sqrt{3}$

B.  $1/\sqrt{2}$

C.  $1/\sqrt{5}$

D. none

**Answer:**



[Watch Video Solution](#)

59. The circle on  $SS'$  as diameter intersects the ellipse in real points then its eccentricity

A.  $e = 1/\sqrt{2}$

B.  $e > 1/\sqrt{2}$

C.  $e < 1/\sqrt{2}$

D. none

**Answer:**



[Watch Video Solution](#)

60. Let  $S, S'$  are the foci and  $BB'$  be the minor axis of an ellipse. If  $\angle BSS' = \theta$  then its eccentricity is

A.  $\tan \theta$

B.  $\sin \theta$

C.  $\cos \theta$

D.  $\coth \eta$

**Answer:**



[Watch Video Solution](#)

61.  $LL'$  is the latusrectum of an ellipse and  $\triangle SLL'$  is an equilateral triangle. The eccentricity of the ellipse is

A.  $1/\sqrt{5}$

B.  $1/\sqrt{3}$

C.  $1/\sqrt{2}$

D.  $\sqrt{2}/\sqrt{3}$

**Answer:**



[Watch Video Solution](#)

62. The latus rectum  $LL'$  subtends a right angle at the centre of the ellipse, then its eccentricity is

A.  $\frac{\sqrt{3} + 1}{2}$

B.  $\frac{\sqrt{2} + 1}{3}$

C.  $\frac{\sqrt{5} - 1}{2}$

D.  $\frac{\sqrt{3} - \sqrt{2}}{2}$

**Answer:**



[Watch Video Solution](#)

**63.** If  $(5, 12)$  and  $(24, 7)$  are the foci of conic passing through  $(0, 0)$ , then the eccentricity of the ellipse is

A.  $\sqrt{368}/13$

B.  $\sqrt{368}/25$

C.  $\sqrt{386}/38$

D. none

**Answer:**



[Watch Video Solution](#)

64. An ellipse passing through  $(4\sqrt{2}, 2\sqrt{6})$  has foci at  $(-4, 0)$  and  $(4, 0)$ . Its eccentricity is

A.  $1/2$

B.  $1/\sqrt{2}$

C.  $1/\sqrt{3}$

D.  $\sqrt{2}$

**Answer:**



[Watch Video Solution](#)

65. The eccentricity of the ellipse which meets the straight line  $x/7 + y/2 = 1$  on the axis of x and the straight line  $x/3 - y/5 = 1$  on the axis of y and whose axes lie along the axes of coordinates, is

A.  $\frac{3\sqrt{2}}{7}$

B.  $\frac{2\sqrt{6}}{7}$



C.  $\frac{\sqrt{3}}{7}$

D. none

**Answer:**



[Watch Video Solution](#)

66. The equations of the directrices of the ellipse

$$25x^2 + 9y^2 - 150x - 90y + 225 = 0$$

A.  $4y + 5 = 0, 4y - 45 = 0$

B.  $4y + 35 = 0, 4y - 15 = 0$

C.  $4y + 35 = 0, 4y - 25 = 0$

D.  $4x - 35 = 0, 4x + 35 = 0$

**Answer:**



[Watch Video Solution](#)

67. The equations of the latus recta of the ellipse

$$9x^2 + 25y^2 - 36x + 50y - 164 = 0 \text{ are}$$

A.  $x = -6, x + 2 = 0$

B.  $x = 6, x + 2 = 0$

C.  $x = -6, x - 2 = 0$

D.  $x = 4, x + 5 = 0$

**Answer:**



**Watch Video Solution**

68. Equations of the latus recta of the ellipse

$$9x^2 + 4y^2 - 18x - 8y - 23 = 0 \text{ are}$$

A.  $y = \pm \sqrt{5}$

B.  $x = \pm \sqrt{5}$

C.  $y = 1 \pm \sqrt{5}$

$$D. x = -1 \pm \sqrt{5}$$

**Answer:**



**Watch Video Solution**

69. The equation of the axes of the ellipse  $25x^2 + 9y^2 - 150x - 90y + 225 = 0$  are

A.  $y + 2 = 0, x = 3$

B.  $y + 1 = 0, x = 2$

C.  $y = 5, x = 3$

D.  $y + 2 = 0, x = 5$

**Answer:**



**Watch Video Solution**

70. If P is a point on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  whose foci are  $S, S'$  then  $PS + PS' =$

A. a

B. 2a

C. b

D. 2b

**Answer:**



[Watch Video Solution](#)

71. If P is a point on the ellipse  $9x^2 + 36y^2 = 324$  whose foci are S and  $S'$ . Then  $PS + PS' =$

A. 9

B. 12

C. 27

D. 36

**Answer:**



[Watch Video Solution](#)

72.

If

$P(x, y), S(3, 0), S'(-3, 0)$  and  $16x^2 + 25y^2 = 400$ , then  $PS + PS'$  :

A. 8

B. 6

C. 10

D. 12

**Answer:**



[Watch Video Solution](#)

73. If P is a point on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  whose foci are  $S, S'$  then  $PS + PS' =$

A.  $ab$

B.  $2ab$

C.  $abe$

D.  $abe^2$

**Answer:**



[Watch Video Solution](#)

74. If  $\pi + \theta$  is the eccentric angle of a point on the ellipse  $16x^2 + 25y^2 = 400$  then the corresponding point on the auxiliary circle is

A. 1

B. 2

C. 3

D. 4

**Answer:**



[Watch Video Solution](#)

75. If  $S$  and  $S''$  are the foci of the ellipse  $\frac{x^2}{25} + \frac{y^2}{16} = 1$  and if  $PSP'$  is a focal chord with  $SP = 8$  then  $SS'' =$

A.  $4 + S'P$

B.  $SP - 1$

C.  $4 + SP$

D.  $SP - 1$

**Answer:**



[Watch Video Solution](#)

76. A man running round a race course notes that the sum of the distances of two flag posts from him is always 10 meters and the distance between the flag posts is 8 meters. Then the area of the path he encloses (in square meters) is

A.  $15\pi$

B.  $12\pi$

C.  $18\pi$

D.  $8\pi$

**Answer:**



[Watch Video Solution](#)

77. P is a variable point on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  with AA as the major axis. Then the maximum value of the area of  $\triangle APA'$  is

A.  $ab$



B.  $2ab$

C.  $ab/2$

D. none

**Answer:**



[Watch Video Solution](#)

**78.** The sides of the rectangle of greatest area that can be inscribed in the ellipse  $x^2 + 4y^2 = 64$  are

A.  $(6\sqrt{2}, 4\sqrt{2})$

B.  $(8\sqrt{2}, 4\sqrt{2})$

C.  $(8\sqrt{2}, 8\sqrt{2})$

D.  $(16\sqrt{2}, 4\sqrt{2})$

**Answer:**



[Watch Video Solution](#)

79. The equation  $\frac{x^2}{r-2} + \frac{y^2}{5-r} = 1$  represents an ellipse if

A.  $r > 2$

B.  $r > 5$

C.  $2 < r < 5$

D.  $r < 2$  or  $r > 5$

**Answer:**



[Watch Video Solution](#)

80. Let E be the ellipse  $x^2/9 + y^2/4 = 1$  and C be the circle  $x^2 + y^2 = 9$ .

Let P and Q be the points (1, 2) and (2, 1) respectively. Then

A. Q lies inside C but outside E

B. Q lies outside both C and E

C. P lies inside both C and E

D. P lies inside C but outside E

**Answer:**



[Watch Video Solution](#)

**81.** The equation of the circle passing through the foci of the ellipse

$$\frac{x^2}{16} + \frac{y^2}{9} = 1, \text{ and having centre at } (0, 3) \text{ is :}$$

A.  $x^2 + y^2 - 6y - 5 = 0$

B.  $x^2 + y^2 - 6y + 5 = 0$

C.  $x^2 + y^2 - 6y - 7 = 0$

D.  $x^2 + y^2 - 6y + 7 = 0$

**Answer:**



[Watch Video Solution](#)

82. The equation of the tangent to the ellipse  $3x^2 + 2y^2 = 30$  at  $(-2, 3)$  is

A.  $x-y+5=0$

B.  $3x-5y-14=0$

C.  $2x-3y-12=0$

D.  $5x-4y-40=0$

**Answer:**



[Watch Video Solution](#)

83. The equation of the normal to the ellipse  $\frac{x^2}{4} + \frac{y^2}{1} = 1$  at  $(2, -1)$  is

A.  $x-y-13=0$

B.  $5x-y+8=0$

C.  $3x+3y-3=0$

D.  $2x+y-3=0$

**Answer:**



[Watch Video Solution](#)

**84.** The equations of the tangents to the ellipse  $3x^2 + 4y^2 = 12$  which are parallel to the line  $2x - y + 5 = 0$  is

A.  $6x - 2y \pm \sqrt{155/3}$

B.  $2x - y \pm \sqrt{19} = 0$

C.  $16x + 22y \pm \sqrt{155/3}$

D.  $2x + 2y \pm \sqrt{39} = 1$

**Answer:**



[Watch Video Solution](#)

**85.** The equations of the tangents to the ellipse  $4x^2 + 3y^2 = 5$  which are perpendicular to the line  $3x - y + 7 = 0$  is

A.  $2x - 2y \pm \sqrt{55} = 0$

B.  $2x - 12y \pm \sqrt{55} = 0$

C.  $2x + 6y \pm \sqrt{65} = 0$

D.  $2x + 2y \pm \sqrt{15} = 0$

**Answer:**



[Watch Video Solution](#)

**86.** The equations of the tangents to the ellipse  $9x^2 + 16y^2 = 144$  at the ends of the latus rectum are

A.  $3x + 4y = \pm 12$

B.  $4x - 3y = \pm 12$

C.  $\sqrt{7}x \pm 4y = 16$

D.  $3x \pm \sqrt{7}y = 16$

**Answer:**



Watch Video Solution

87. The equation of tangent to the ellipse  $2x^2 + 3y^2 = 6$  which make an angle  $30^\circ$  with the major axis is

A.  $x - \sqrt{3}y \pm 3 = 0$

B.  $x + \sqrt{3}y \pm 3 = 0$

C.  $3x - \sqrt{3}y \pm 13 = 0$

D.  $x - \sqrt{5}y \pm 3 = 0$

Answer:



Watch Video Solution

88. If  $x + ky - 5 = 0$  is a tangent to the ellipse  $4x^2 + 9y^2 = 20$  then  $k =$

A. 3

B. -3

C.  $\pm 3$

D. none

**Answer:**



[Watch Video Solution](#)

89. The values that  $m$  can take so that the straight line  $y = 4x + m$  touches the curve  $x^2 + 4y^2 = 4$  is

A.  $\pm \sqrt{45}$

B.  $\pm \sqrt{60}$

C.  $\pm \sqrt{65}$

D.  $\pm \sqrt{72}$

**Answer:**



[Watch Video Solution](#)



90. The number of values of  $c$  such that the straight line  $y = 4x + c$  touches the curve  $x^2/4 + y^2 = 1$  is

- A. 0
- B. 1
- C. 2
- D. infinite

**Answer:**



[Watch Video Solution](#)

91. The point of contact  $4x - 5y + 25 = 0$  with the ellipse  $9x^2 + 25y^2 = 225$  is

- A.  $(-4, 9/5)$
- B.  $(-4, 3/5)$
- C.  $(4, -3)$

D. (-5, 2)

**Answer:**



[Watch Video Solution](#)

92. Find the condition for the line  $x \cos \alpha + y \sin \alpha = p$  to be a tangent to the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .

A.  $a^2 \cos^2 \alpha + b^2 \sin^2 \alpha = p^2$

B.  $a^2 \cos^2 \alpha - b^2 \sin^2 \alpha = p^2$

C.  $a^2 \sin^2 \alpha + b^2 \cos^2 \alpha = p^2$

D.  $a^2 \sin^2 \alpha - b^2 \cos^2 \alpha = p^2$

**Answer:**



[Watch Video Solution](#)

93. The condition that the line  $\frac{x}{p} + \frac{y}{q} = 1$  to be a tangent to the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  is

A.  $\frac{2a^2}{p^2} + \frac{3b^2}{q^2} = 1$

B.  $\frac{a^2}{p^2} + \frac{b^2}{q^2} = 1$

C.  $\frac{a^2}{b^2} + \frac{b^2}{a^2} = 1$

D.  $\frac{a^2}{p^2} - \frac{b^2}{q^2} = 1$

**Answer:**



[Watch Video Solution](#)

94. The line  $x \cos \alpha + y \sin \alpha = p$  is a tangent to the ellipse  $x^2/a^2 + y^2/b^2 = 1$ . The point of contact is

A.  $\left(\frac{a^2}{p}, \frac{b^2}{p}\right)$

B.  $\left(\frac{a^2}{p \sin^2 \alpha}, \frac{b^2}{p \cos^2 \alpha}\right)$

C.  $\left(\frac{a^2 \sin^2 \alpha}{p}, \frac{b^2 \cos^2 \alpha}{p}\right)$

D.  $\left( \frac{a^2 \cos \alpha}{p}, \frac{b^2 \sin \alpha}{p} \right)$

**Answer:**



**Watch Video Solution**

95. The number of tangents to  $\frac{x^2}{25} + \frac{y^2}{9} = 1$  through (1,1) is

A. 0

B. 1

C. 2

D. 3

**Answer:**



**Watch Video Solution**

96. The sum of the slopes of the tangents to the ellipse  $x^2/9 + y^2/4 = 1$  drawn from the point (6, -2) is

A. 0

B.  $3/4$

C.  $-6/7$

D.  $-8/9$

**Answer:**



[Watch Video Solution](#)

97. The product of the slopes of the tangents to the ellipse  $2x^2 + 3y^2 = 6$  drawn from the point (1, 2) is

A. 1

B. 2

C. -1

D. -2

**Answer: C**



[Watch Video Solution](#)

**98.** The total number of real tangents that can be drawn to the ellipse  $3x^2 + 5y^2 = 32$  and  $25x^2 + 9y^2 = 450$  passing through  $(3, 5)$  is

A. 0

B. 2

C. 3

D. 4

**Answer:**



[Watch Video Solution](#)

99. If any tangent to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  intercepts equal length  $l$  on the axes then  $l =$

A.  $a^2 + b^2$

B.  $\sqrt{a^2 + b^2}$

C.  $(a^2 + b^2)^2$

D. none

**Answer:**



[Watch Video Solution](#)

100. The equation to the director circle of the ellipse  $2x^2 + 3y^2 = 6$  is

A.  $x^2 + y^2 = 41$

B.  $x^2 + y^2 = 25$

C.  $x^2 + y^2 = 5$

D.  $x^2 + y^2 = 43$

**Answer:**



**Watch Video Solution**

**101.** The equation to the auxiliary circle of  $\frac{x^2}{12} + \frac{y^2}{18} = 1$  is

A.  $x^2 + y^2 = 12$

B.  $x^2 + y^2 = 18$

C.  $x^2 + y^2 = 6$

D.  $x^2 + y^2 = 30$

**Answer:**



**Watch Video Solution**

**102.** The equation to the circle on  $S'S$  as diameter where  $S$  and  $S'$  are the foci of an ellipse  $x^2/a^2 + y^2/b^2 = 1$  is



A.  $x^2 + y^2 = a^2$

B.  $x^2 + y^2 = b^2$

C.  $x^2 + y^2 = a^2 e^2$

D.  $x^2 + y^2 = a^2 + b^2$

**Answer:**



**Watch Video Solution**

**103.** The radius of the circle passing through the foci of the ellipse

$\frac{x^2}{16} + \frac{y^2}{9} = 1$ , and having its centre at  $(0, 3)$  is

A. 4

B. 3

C.  $\sqrt{12}$

D.  $7/2$

**Answer:**



Watch Video Solution

104. If tangents are drawn from any point on the circle  $x^2 + y^2 = 25$  to the ellipse  $\frac{x^2}{16} + \frac{y^2}{9} = 1$  then the angle between the tangents is

- A.  $(2, 3\sqrt{3}/2), (4, 0)$
- B.  $(2, \sqrt{3}/\sqrt{2}), (4, \sqrt{3}/2)$
- C.  $(4, 3\sqrt{3}/\sqrt{3}), (2, 0)$
- D.  $(2, 0), (4, 0)$

Answer:



Watch Video Solution

105. The locus of the point of intersection of the perpendicular tangents to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  is

- A.  $x^2 + y^2 = a^2$

B.  $x^2 + y^2 = b^2$

C.  $x^2 + y^2 = a^2 + b^2$

D.  $x^2 + y^2 = a^2 - b^2$

**Answer:**



**Watch Video Solution**

**106.** The locus of the point of intersection of two tangents to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  which make an angle  $60^\circ$  with one another is

A.  $(x^2 + y^2 - a^2 - b^2)^2 = 12(b^2x^2 + a^2y^2 - a^2b^2)$

B.  $(x^2 + y^2 - a^2 - b^2)^2 = 4(b^2x^2 + a^2y^2 - a^2b^2)$

C.  $3(x^2 + y^2 - a^2 - b^2)^2 = 4(b^2x^2 + a^2y^2 - a^2b^2)$

D.  $x^2 + y^2 = a^2 + b^2$

**Answer:**



**Watch Video Solution**

107. If tangents are drawn from any point on the circle  $x^2 + y^2 = 25$  to the ellipse  $\frac{x^2}{16} + \frac{y^2}{9} = 1$  then the angle between the tangents is

A.  $\frac{\pi}{4}$

B.  $\frac{\pi}{3}$

C.  $\frac{\pi}{2}$

D.  $2\frac{\pi}{3}$

**Answer:**



[Watch Video Solution](#)

108. The product of the perpendiculars from the foci on any tangent to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  is

A.  $a^2$

B.  $a^2 - b^2$

C.  $b^2$

D.  $\sqrt{a^2 + b^2}$

**Answer:**



[Watch Video Solution](#)

109. If  $F_1, F_2, F_3$  be the feet of the perpendicular from the foci  $S_1, S_2$  of an ellipse  $x^2/5 + y^2/3 = 1$  on the tangent at any point P on the ellipse then  $S_1F_1 \cdot S_2F_2 =$

A. 2

B. 3

C. 4

D. 5

**Answer:**



[Watch Video Solution](#)

110. Perpendiculars are drawn from the points  $(0, \pm ae)$  on any tangent to  $x^2/a^2 + y^2/b^2 = 1$ . Then the sum of their squares is

A.  $2b^2$

B.  $2a^2$

C.  $b^2$

D.  $a^2$

**Answer:**



[Watch Video Solution](#)

111. The sum of the squares of the perpendiculars on any tangent to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  from two points on the minor axis each at a distance  $\sqrt{a^2 - b^2}$  from the centre is

A.  $2a^2$

B.  $2b^2$

C.  $a^2 + b^2$

D.  $a^2 - b^2$

**Answer:**



**Watch Video Solution**

112. Let  $d$  and  $d'$  be the perpendicular distances from the foci of an ellipse to the tangent at  $P$  on the ellipse whose foci are  $S$  and  $S'$ . Then  $S'P:SP =$

A.  $d:d'$

B.  $d':d$

C.  $d^2:d'^2$

D.  $a:b$

**Answer:**

[Watch Video Solution](#)

113. Tangents to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  make angles  $\theta_1, \theta_2$  with the major axis. The equation of the locus of their point of intersection when  $\tan(\theta_1 + \theta_2) = k$  is

A.  $xy = k(x^2 + y^2 + a^2 + b^2)$

B.  $2xy = k(x^2 - y^2 + a^2 + b^2)$

C.  $2xy = k(x^2 - y^2 - a^2 + b^2)$

D.  $2xy = k(x^2 - y^2 - a^2 - b^2)$

**Answer:**

[Watch Video Solution](#)

114. The tangent to  $x^2/a^2 + y^2/b^2 = 1$  meets the major and minor axes in P and Q respectively, then  $a^2/CP^2 + b^2/CQ^2 =$



A. 4

B. 3

C. 2

D. 1

**Answer:**



[Watch Video Solution](#)

**115.**  $S(3, 4)$  and  $S'(9, 12)$  are the foci of an ellipse and the foot of the perpendicular from  $S$  to a tangent to the ellipse is  $(1, -4)$ . Then the eccentricity of the ellipse is

A.  $3/13$

B.  $4/13$

C.  $5/13$

D. none

**Answer:**



**Watch Video Solution**

**116.** The locus of the foot of the perpendicular drawn from the centre of the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  to any of its tangents is

A.  $(x^2 + y^2)^2 = a^2x^2 + b^2y^2$

B.  $(x^2 - y^2)^2 = a^2x^2 + b^2y^2$

C.  $(x^2 + y^2)^2 = a^2x^2 - b^2y^2$

D.  $(x^2 - y^2)^2 = a^2x^2 - b^2y^2$

**Answer:**



**Watch Video Solution**

**117.** The area (in sq . Unit ) of the quadrilateral formed by the tangents at the end points of the latera recta to the ellipse  $\frac{x^2}{9} + \frac{y^2}{5} = 1$  is

A.  $\frac{27}{4}$

B. 18

C.  $\frac{27}{2}$

D. 27

**Answer:**



**Watch Video Solution**

**118.** C is the centre of the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  and L is an end of a latusrectum. If the normal at L meets the major axis at G then CG =

A.  $ae$

B.  $ae^2$

C.  $ae^3$

D.  $ae^4$

**Answer:**



[Watch Video Solution](#)

119. If the normal at the end of latus rectum of an ellipse  $x^2/a^2 + y^2/b^2 = 1$  of eccentricity  $e$  passes through one end of the minor axis then  $e^4 + e^2 =$

- A. 0
- B. 1
- C. -1
- D. 2

**Answer:**



[Watch Video Solution](#)

120. The slope of a common tangent to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  and a concentric circle of radius  $r$  is

A.  $\tan^{-1} \sqrt{\left[ \frac{r^2 - b^2}{a^2 - r^2} \right]}$

B.  $\sqrt{\left[ \frac{r^2 - b^2}{a^2 - r^2} \right]}$

C.  $\left[ \frac{r^2 - b^2}{a^2 - r^2} \right]$

D.  $\sqrt{\left[ \frac{a^2 - r^2}{r^2 - b^2} \right]}$

**Answer:**

 [Watch Video Solution](#)

**121.** The parametric representation  $(2 + t^2, 2t + 1)$  represents

- A. a parabola with focus at (2, 1)
- B. a parabola with vertex at (2, 1)
- C. an ellipse with centre at (2, 1)
- D. none

**Answer:**

 [Watch Video Solution](#)

122. The points on the ellipse  $2x^2 + 3y^2 = 6$  whose eccentric angles differ by two right angles is

- A.  $(\sqrt{3} \cos \theta, \sqrt{2} \sin \theta), (-\sqrt{3} \cos \theta, -\sqrt{2} \sin \theta)$
- B.  $(\sqrt{3} \cos \theta, -\sqrt{2} \sin \theta), (\sqrt{3} \cos \theta, \sqrt{2} \sin \theta)$
- C.  $(\sqrt{3} \cos \theta, \sqrt{2} \sin \theta), (\sqrt{3} \cos \theta, -\sqrt{2} \sin \theta)$
- D.  $(\sqrt{3} \cos \theta, \sqrt{2} \sin \theta), (-\sqrt{3} \cos \theta, \sqrt{2} \sin \theta)$

**Answer:**



**Watch Video Solution**

123. The equation of the tangent at a point  $\theta = 3\pi/4$  to the ellipse  $x^2/16 + y^2/9 = 1$  is

- A.  $3x + 4y + 12\sqrt{2} = 0$
- B.  $3x + 4y - 12\sqrt{2} = 0$

C.  $3x - 4y + 12\sqrt{2} = 0$

D.  $3x - 4y - 12\sqrt{2} = 0$

**Answer:**



[Watch Video Solution](#)

**124.** The equation of the normal to the ellipse  $x^2/16 + y^2/9 = 1$  at the point whose eccentric angle  $\theta = \pi/6$  is

A.  $5x - 3y = 8\sqrt{2}$

B.  $8x - 6\sqrt{3}y = 7\sqrt{3}$

C.  $6x + \sqrt{2}y = 2\sqrt{2}$

D.  $2x + 3\sqrt{3}y = 12$

**Answer:**



[Watch Video Solution](#)

125. If  $\frac{x}{a} + \frac{y}{b} = \sqrt{2}$  touches the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ , then its eccentric angle ' $\theta$ ' is equal to

A.  $0^\circ$

B.  $90^\circ$

C.  $45^\circ$

D.  $60^\circ$

**Answer:**



**Watch Video Solution**

126. The distance of a point on the ellipse  $x^2/6 + y^2/2 = 1$  from the centre is 2. The eccentric angle of the point is

A.  $\pi/3$

B.  $2\pi/3$

C.  $\pi/4$



D.  $\pi/6$

**Answer:**



**Watch Video Solution**

**127.** The eccentric angles of the extremities of latusrecta of the ellipse

$$x^2/a^2 + y^2/b^2 = 1 \text{ is}$$

A.  $\tan^{-1}\left(\pm \frac{b}{ae}\right)$

B.  $\sin^{-1}\left(\pm \frac{b}{ae}\right)$

C.  $\cos^{-1}\left(\pm \frac{b}{ae}\right)$

D.  $\sec^{-1}\left(\pm \frac{b}{ae}\right)$

**Answer:**



**Watch Video Solution**

128. The tangent and normal to the ellipse  $4x^2 + 9y^2 = 36$  at a point P on it meets the major axis in Q and R respectively. If  $QR = 4$ , then the eccentric angle of P is

A.  $\cos^{-1} \frac{3}{5}$

B.  $\cos^{-1} \frac{2}{3}$

C.  $\cos^{-1} \frac{1}{3}$

D.  $\cos^{-1} \frac{1}{5}$

**Answer:**



**Watch Video Solution**

129. If  $\alpha$  and  $\beta$  are the eccentric angles of the ends of a focal chord of the ellipse then  $\cos^2\left(\frac{\alpha + \beta}{2}\right)\sec^2\left(\frac{\alpha - \beta}{2}\right) =$

A.  $\frac{a^2 + b^2}{a^2}$

B.  $(a^2) - b^2 \frac{1}{a^2}$

C.  $\frac{a^2}{a^2 + b^2}$

D.  $\frac{a^2}{a^2 - b^2}$

**Answer:**



**Watch Video Solution**

**130.** The tangent at a point  $P(a \cos \theta, b \sin \theta)$  on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  meets the auxillary circle in two points. The chord joining them subtends a right angle at the centre. Find the eccentricity of the ellipse:

A.  $\sqrt{1 + \sin^2 \alpha}$

B.  $\sqrt{1 + \cos^2 \alpha}$

C.  $\frac{1}{\sqrt{1 + \sin^2 \alpha}}$

D.  $\frac{1}{\sqrt{1 + \cos^2 \alpha}}$

**Answer:**



[Watch Video Solution](#)

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

A.  $(x^2 + y^2)^2 = 6x^2 + 2y^2$

B.  $(x^2 + y^2)^2 = 6x^2 - 2y^2$

C.  $(x^2 - y^2)^2 = 6x^2 + 2y^2$

D.  $(x^2 - y^2)^2 = 6x^2 - 2y^2$

**Answer:**

[Watch Video Solution](#)

132. If P is a point on the ellipse of eccentricity e and A, A' are the vertices and S, S' are the foci then area of  $\triangle SPS'$  : area of  $\triangle APA'$  =

A.  $\angle A'PA$

B.  $\angle A'PS$

C.  $\angle S'PS$

D.  $\angle S'PA$

**Answer:**



**Watch Video Solution**

133.  $P(\theta)$  and  $D\left(\frac{\pi}{2} + \theta\right)$  are two points on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .

Show that the locus of the point of intersection of tangents at P and Q to

the ellipse is  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 2$

A.  $x^2/a^2 + y^2/b^2 = 1/a$

B.  $x^2/a^2 + y^2/b^2 = 1/b$

C.  $x^2/a^2 + y^2/b^2 = 1/2$

D.  $x^2/a^2 + y^2/b^2 = 1/6$

**Answer:**



Watch Video Solution

134.  $P(\theta)$  and  $D\left(\frac{\pi}{2} + \theta\right)$  are two points on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .

Show that the locus of the point of intersection of tangents at P and Q to

the ellipse is  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 2$

A.  $x^2/a^2 + y^2/b^2 = a$

B.  $x^2/a^2 + y^2/b^2 = b$

C.  $x^2/a^2 + y^2/b^2 = 2$

D.  $x^2/a^2 + y^2/b^2 = ab$

**Answer:**



Watch Video Solution

135. The maximum number of normals that can be drawn from any point to an ellipse, in general, is

A. 1

B. 2

C. 3

D. 4

**Answer:**



**Watch Video Solution**

**136.** The condition that the line  $lx + my + n = 0$  to be a normal to the

ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  is

A.  $a^2 - b^2$

B.  $a^2 + b^2$

C.  $(a^2 + b^2)^2$

D.  $(a^2 - b^2)^2$

**Answer:**



Watch Video Solution

137. The normal at a point  $P(\theta)$  on the ellipse  $5x^2 + 14y^2 = 70$  cuts the curve again at a point  $Q(2\theta)$  then  $\cos\theta$

A.  $2/3$

B.  $-2/3$

C.  $1/3$

D.  $-1/3$

Answer:



Watch Video Solution

138. If the normal at  $\theta$  on the hyperbola  $x^2/a^2 - y^2/b^2 = 1$  meets the transverse axis at  $G$ , then  $AG \cdot A'G =$

A.  $SP$



B. eSP

C. SP/e

D. e

**Answer:**



**Watch Video Solution**

**139.** The tangent at a point  $P(a \cos \theta, b \sin \theta)$  on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  meets the auxillary circle in two points. The chord joining them subtends a right angle at the centre. Find the eccentricity of the ellipse:

A.  $x^2 + y^2 = (a + b)^2$

B.  $x^2 + y^2 = (a - b)^2$

C.  $x^2 - y^2 = (a + b)^2$

D.  $x^2 - y^2 = (a - b)^2$

**Answer:**



[Watch Video Solution](#)

**140.** The tangent at 'p' on the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  cuts the major axis in T and PN is the perpendicular to the x-axis, C being centre then  $CN \cdot CT =$

A.  $a^2$

B.  $b^2$

C.  $2a^2$

D.  $2b^2$

**Answer:**



[Watch Video Solution](#)

1. The equation of the chord of contact of the point  $(1, -2)$  w.r.t the ellipse

$$4x^2 + 5y^2 = 20 \text{ is}$$

A.  $x + 16y - 12 = 0$

B.  $2x - 5y - 10 = 0$

C.  $5x + 7y - 16 = 0$

D.  $x - 15y - 20 = 0$

**Answer:**



[Watch Video Solution](#)

2. The equation of the polar of the point  $(2, -1)$  w.r.t the ellipse

$$3x^2 + 4y^2 = 12 \text{ is}$$

A.  $x + y - 1 = 0$

B.  $3x - 2y - 6 = 0$

C.  $5x - 5y - 6 = 0$

$$D. 13x - 9y + 16 = 0$$

**Answer:**



[Watch Video Solution](#)

3. Pole of the line  $2x + 3y + 4 = 0$  w.r.t. the ellipse  $x^2/2 + y^2/4 = 1$  is

A. (1, 3)

B. (1, -3)

C. (-1, 3)

D. (-1, -3)

**Answer:**



[Watch Video Solution](#)

4. The pole of line  $x = a/e$  with respect to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  is

A.  $(a/e, 0)$

B.  $(-a/e, 0)$

C.  $(ae, 0)$

D.  $(-ae, 0)$

**Answer:**



[Watch Video Solution](#)

5. The pole of the line  $y = x + 2$  with respect to the ellipse  $x^2 + 2y^2 - 4x + 12y + 14 = 0$  is

A.  $(9/4, -5/24)$

B.  $(6/7, -17/7)$

C.  $(-26/35, 4)$

D. none

**Answer:**



[Watch Video Solution](#)

6. The value of  $k$  if  $(1, 2)$ ,  $(k, -1)$  are conjugate points with respect to the ellipse  $2x^2 + 3y^2 = 6$  is

A. 2

B. 4

C. 6

D. 8

**Answer:**



[Watch Video Solution](#)

7. If  $2x - y + 3 = 0$ ,  $4x + ky + 3 = 0$  are conjugate with respect to the ellipse  $5x^2 + 6y^2 - 15 = 0$  then  $k =$

A. 1

B. 2

C. 3

D. 6

**Answer:**



[Watch Video Solution](#)

8. The locus of poles with respect to the hyperbola  $x^2/a^2 - y^2/b^2 = 1$  of tangents to its auxiliary circle is

A.  $x^2/a^2 + y^2/b^2 = 1/a^2$

B.  $x^2/a^2 + y^2/b^2 = 1/b^2$

C.  $x^2/a^4 + y^2/b^4 = 1/a^2$

$$D. x^2/a^4 + y^2/b^4 = 1/b^2$$

**Answer:**



**Watch Video Solution**

**9.** Show that the locus of middle points of a focal chord of an ellipse

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 \text{ is } \frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{ex}{a}$$

A.  $\alpha^2 x^2/a^2 + \beta^2 y^2/b^2 = 1$

B.  $\alpha^2 x^2/a^4 + \beta^2 y^2/b^4 = 1$

C.  $\alpha^2 x^2/b^4 + \beta^2 y^2/a^4 = 1$

D.  $\alpha^2 x^2/b^2 + \beta^2 y^2/a^2 = 1$

**Answer:**



**Watch Video Solution**



10. The locus of midpoints of chords of the ellipse  $x^2/a^2 + y^2/b^2 = 1$  which pass through the positive end of the major axis is

A.  $x^2/a^4 + y^2/b^4 = 1/a^2 + 1/b^2$

B.  $x^2/a^4 + y^2/b^4 = 1/a^2 - 1/b^2$

C.  $x^2/a^4 - y^2/b^4 = 1/a^2 + 1/b^2$

D.  $x^2/a^4 - y^2/b^4 = 1/a^2 - 1/b^2$

**Answer:**



**Watch Video Solution**

11. If the chords of contact of tangents from two points

$(x_1, y_1)$  and  $(x_2, y_2)$  to the hyperbola  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$  are at right angles,

then find  $\frac{x_1 x_2}{y_1 y_2}$

A.  $a^2/b^2$

B.  $-b^2/a^2$

C.  $-a^4/b^4$

D.  $-b^4/a^4$

**Answer:**

 [Watch Video Solution](#)

12. The equation of the chord of the ellipse  $2x^2 + 3y^2 = 6$  having  $(1, -1)$  as its midpoint is

A.  $8x + 9y - 25 = 0$

B.  $2x - 3y - 5 = 0$

C.  $x + y - 1 = 0$

D.  $3x - 2y - 6 = 0$

**Answer: B**

 [Watch Video Solution](#)

13. The midpoint of a chord of the ellipse  $x^2 + 4y^2 - 2x + 20y = 0$  is (2, -4). The equation of the chord is

A.  $x - 6y = 26$

B.  $x + 6y = 26$

C.  $6x - y = 26$

D.  $6x + y = 26$

**Answer:**



[Watch Video Solution](#)

14. The midpoint of the chord  $4x + 5y - 13 = 0$  of the ellipse  $2x^2 + 5y^2 = 20$  is

A. (2, -1)

B. (-2, 1)

C. (-2, -1)

D. (2, 1)

**Answer:**



[Watch Video Solution](#)

15. If the line  $2x + 5y = 12$  intersects the ellipse  $4x^2 + 5y^2 = 20$  in two distinct points A and B, then the midpoint of AB is

A. (0, 10)

B. (1, 2)

C. (1, 0)

D. (2, 1)

**Answer:**



[Watch Video Solution](#)

16. The locus of midpoints of chords of the ellipse  $x^2/a^2 + y^2/b^2 = 1$  which pass through the positive end of the major axis is

A.  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{ex}{a}$

B.  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = \frac{ex}{a}$

C.  $x^2 + y^2 = a^2 + b^2$

D. none of these

**Answer:**



[Watch Video Solution](#)

17. The locus of midpoints of chords of the ellipse  $x^2/a^2 + y^2/b^2 = 1$  which pass through the positive end of the major axis is

A.  $x^2/a^2 + y^2/b^2 = 1/a$

B.  $x^2/a^2 + y^2/b^2 = x/a$

C.  $x^2/a^2 + y^2/b^2 = y/a$

$$D. x^2/a^2 + y^2/b^2 = 1/b$$

**Answer:**



**Watch Video Solution**

**18.** The locus of midpoints of chords of the ellipse  $x^2/a^2 + y^2/b^2 = 1$  that pass through the focus  $(ae, 0)$  is

A.  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{x}{a^2}$

B.  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{ex}{a^2}$

C.  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{x^2}{a^4}$

D.  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = \frac{ex}{a}$

**Answer:**



**Watch Video Solution**

19. The locus of the point of intersection of the perpendicular tangents to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  is

A.  $\left(\frac{x^2}{a^2} + \frac{y^2}{b^2}\right)^2 = \frac{x^2 + y^2}{a^2 + b^2}$

B.  $\left(\frac{x^2}{a^2} - \frac{y^2}{b^2}\right)^2 = \frac{x^2 + y^2}{a^2 + b^2}$

C.  $\left(\frac{x^2}{a^2} + \frac{y^2}{b^2}\right)^2 = \frac{x^2 - y^2}{a^2 + b^2}$

D.  $\left(\frac{x^2}{a^2} + \frac{y^2}{b^2}\right)^2 = \frac{x^2 - y^2}{a^2 - b^2}$

**Answer:**



[Watch Video Solution](#)

20. The equation of the locus of the middle point of the portion of a tangent to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  included between the axes is

A.  $a^2x^2 + b^2y^2 = 4x^2y^2$

B.  $b^2x^2 + a^2y^2 = 4x^2y^2$

C.  $a^2x^2 - b^2y^2 = 4x^2y^2$

$$D. b^2x^2 - a^2y^2 = 4x^2y^2$$

**Answer:**



**Watch Video Solution**

21. The locus of midpoints of chords of the ellipse  $x^2/a^2 + y^2/b^2 = 1$  that pass through the focus  $(ae, 0)$  is

A.  $\left(\frac{x^2}{a^2} + \frac{y^2}{b^2}\right)^2 = \frac{x^2}{a^4} + \frac{y^2}{b^4}$

B.  $\left(\frac{x^2}{a^2} + \frac{y^2}{b^2}\right)^2 = b^2\left(\frac{x^2}{a^4} + \frac{y^2}{b^4}\right)$

C.  $\left(\frac{x^2}{a^2} + \frac{y^2}{b^2}\right)^2 = a^2\left(\frac{x^2}{a^4} + \frac{y^2}{b^4}\right)$

D. none

**Answer:**



**Watch Video Solution**



22. A variable line drawn through the point of intersection of the lines

$$\frac{x}{a} + \frac{y}{b} = 1, \frac{x}{b} + \frac{y}{a} = 1$$
 meets the coordinate axes in A and B. Then

the locus of midpoint of AB is

A.  $\frac{a^2}{x^2} + \frac{b^2}{y^2} = 4$

B.  $\frac{a^2}{x^2} - \frac{b^2}{y^2} = 4$

C.  $\frac{a^2}{x^2} + \frac{b^2}{y^2} = 2$

D.  $\frac{b^2}{x^2} + \frac{a^2}{y^2} = 4$

**Answer:**



[Watch Video Solution](#)

23. The locus of midpoints of chords of the ellipse  $x^2/a^2 + y^2/b^2 = 1$

which pass through the positive end of the major axis is

A.  $x^2/a^6 + y^2/b^6 = (a^2 + b^2)^2$

B.  $x^2/a^6 + y^2/b^6 = (a^2 - b^2)^2$

$$C. a^6/x^2 + b^6/y^2 = (a^2 + b^2)^2$$

$$D. a^6/x^2 + b^6/y^2 = (a^2 - b^2)^2$$

**Answer:**



**Watch Video Solution**

**24.** The equation of the locus of the middle point of the portion of a tangent to the ellipse  $x^2/a^2 + y^2/b^2 = 1$  included between the axes is

$$A. x^2/a^2 + y^2/b^2 = 4$$

$$B. a^2/x^2 + b^2/y^2 = 4$$

$$C. a^2x^2 + b^2y^2 = 4$$

$$D. b^2x^2 + a^2y^2 = 4$$

**Answer:**



**Watch Video Solution**

## Exercise 2 Set 1

1. I : The equation of the ellipse with its axes as the coordinate axes respectively and whose latus rectum = 8 and eccentricity =  $1/\sqrt{2}$  is  $x^2/64 + y^2/32 = 1$

II : The equation of the ellipse with its axes as the coordinate axes respectively and whose minor axis = 6 and eccentricity =  $1/2$  is  $x^2/12 + y^2/9 = 1$

- A. only I is true
- B. only II is true
- C. both I and II are true
- D. neither I nor II true

**Answer:**



[Watch Video Solution](#)

2. The equation of the tangent to the ellipse  $3x^2 + 2y^2 = 30$  at  $(-2, 3)$  is

- A. only I is true
- B. only II is true
- C. both I and II are true
- D. neither I nor II true

**Answer:**



[Watch Video Solution](#)

## Exercise 2 Set 2

1. The equation of the chord of contact of the point  $(1, -2)$  w.r.t the ellipse

$$4x^2 + 5y^2 = 20 \text{ is}$$

- A. a, b, c
- B. b, c, a

C. c, a, b

D. b, a, c

**Answer:**



**Watch Video Solution**