NCERT Solutions Class 11 Maths
Chapter 10: Conic Sections
EXERCISE 10.3

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Quick Summary: NCERT Solutions Class 11 Maths Chapter 10 Exercise 10.3 focuses on parabola problems, covering standard equations, focal properties, and key characteristics of parabolic curves. Students learn to identify and work with different forms of parabola equations, find focus, directrix, vertex, and axis of symmetry, which are crucial topics for CBSE Class 11 exams and JEE preparation.

Key Takeaways:

- Standard parabola equations: y^2 = 4ax, x^2 = 4ay, (y-k)^2 = 4a(x-h), and (x-h)^2 = 4a(y-k)
- Focus and directrix relationship: distance from any point on parabola to focus equals distance to directrix
- Latus rectum length is 4a where a is the focal parameter
- Vertex form transformations help solve real-world applications involving parabolic motion and reflective properties

Complete Solutions

Question 1

QUESTION

In each of the Exercises 1 to 9, find the coordinates of the foci, the vertices, the length of the major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

For the ellipse (x^2)/(36) + (y^2)/(16) = 1.

SOLUTION

We are given the equation of an ellipse and asked to find its foci, vertices, major and minor axes lengths, eccentricity, and latus rectum length.

Step 1: Identify the standard form and parameters

The given equation is . Comparing this with the standard form of an ellipse , we can identify and . Since , the major axis is along the x-axis.

Therefore, and .

Step 2: Calculate (distance from center to focus)

We know that . Substituting the values of and , we get:

So, .

Step 3: Determine the coordinates of the foci and vertices

The foci are located at , which gives us . So, the foci are .

The vertices are located at , which gives us . So, the vertices are .

Step 4: Calculate the lengths of the major and minor axes

The length of the major axis is .

The length of the minor axis is .

Step 5: Calculate the eccentricity

The eccentricity is given by .

Step 6: Calculate the length of the latus rectum

The length of the latus rectum is given by .

Final Answer:

Focus:

Vertices:

Major axis =

Minor axis =

Eccentricity:

Latus rectum =

ANSWER

Focus: F(± √20, 0)

Vertices: V(± 6, 0)

Major axis = 12

Minor axis = 8

Eccentricity: e = √206

Latus rectum = (16)/(3)

Question 2

QUESTION

In each of the Exercises 1 to 9, find the coordinates of the foci, the vertices, the length of the major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

For the ellipse (x^2)/(4) + (y^2)/(25) = 1.

SOLUTION

We are given the equation of an ellipse and asked to find its foci, vertices, major and minor axes lengths, eccentricity, and latus rectum length.

Step 1: Identify the form of the ellipse equation

The given equation is . This is of the form , where . This means the major axis is along the y-axis.

Step 2: Determine the values of a and b

Comparing the given equation with the standard form, we have and . Therefore, and .

Step 3: Calculate the coordinates of the vertices

Since the major axis is along the y-axis, the vertices are at . Thus, the vertices are .

Step 4: Calculate the length of the major and minor axes

The length of the major axis is . The length of the minor axis is .

Step 5: Calculate the eccentricity (e)

The eccentricity is given by the formula . Substituting the values of and , we get:

Step 6: Calculate the coordinates of the foci

The foci are at , where . We have . Therefore, the foci are .

Step 7: Calculate the length of the latus rectum

The length of the latus rectum is given by .

Final Answer:

Focus:

Vertices:

Major axis =

Minor axis =

Eccentricity:

Latus rectum =

ANSWER

Focus: $F(0, \pm \sqrt{21})$

Vertices: $V(0, \pm 5)$

Major axis = 10

Minor axis = 4

Eccentricity: $e = \sqrt{215}$

Latus rectum = $(8)/(5)$

Question 3

QUESTION

In each of the Exercises 1 to 9, find the coordinates of the foci, the vertices, the length of the major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

For the ellipse (x^2)/(16) + (y^2)/(9) = 1.

SOLUTION

We are given the equation of an ellipse and asked to find its foci, vertices, major and minor axes lengths, eccentricity, and latus rectum length.

Step 1: Identify the standard form and parameters

The given equation is . This is of the form , where and . Since , the major axis is along the x-axis.

Therefore, and .

Step 2: Calculate (distance from center to focus)

We know that . Substituting the values of and , we get:

So, .

Step 3: Determine the foci and vertices

The foci are located at , which are . The vertices are located at , which are .

Step 4: Calculate the lengths of the major and minor axes

The length of the major axis is . The length of the minor axis is .

Step 5: Calculate the eccentricity

The eccentricity is given by .

Step 6: Calculate the length of the latus rectum

The length of the latus rectum is given by .

Final Answer:

Focus:

Vertices:

Major axis =

Minor axis =

Eccentricity:

Latus rectum =

ANSWER

Focus: F(± √7, 0)

Vertices: V(± 4, 0)

Major axis = 8

Minor axis = 6

Eccentricity: e = √74

Latus rectum = (9)/(2)

Question 4

QUESTION

In each of the Exercises 1 to 9, find the coordinates of the foci, the vertices, the length of the major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

For the ellipse (x^2)/(25) + (y^2)/(100) = 1.

SOLUTION

We are given the equation of an ellipse and asked to find its foci, vertices, length of major and minor axes, eccentricity, and length of the latus rectum.

Step 1: Identify the form of the ellipse equation

The given equation is . This is of the form , where . This means the major axis is along the y-axis.

Step 2: Determine the values of a and b

Comparing the given equation with the standard form, we have:

, so

, so

Step 3: Calculate the coordinates of the vertices

Since the major axis is along the y-axis, the vertices are at . Therefore, the vertices are .

Step 4: Calculate the length of the major and minor axes

Length of the major axis =

Length of the minor axis =

Step 5: Calculate the eccentricity (e)

The eccentricity is given by . Substituting the values of and :

Step 6: Calculate the coordinates of the foci

The foci are at , where . So, . Therefore, the foci are .

Step 7: Calculate the length of the latus rectum

The length of the latus rectum is given by .

Focus:

Vertices:

Major axis =

Minor axis =

Eccentricity:

Latus rectum =

ANSWER

Focus: F(0, ± √75)

Vertices: V(0, ± 10)

Major axis = 20

Minor axis = 10

Eccentricity: e = √32

Latus rectum = 5

Question 5

QUESTION

In each of the Exercises 1 to 9, find the coordinates of the foci, the vertices, the length of the major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

For the ellipse (x^2)/(49) + (y^2)/(36) = 1.

SOLUTION

We are asked to find the foci, vertices, length of major and minor axes, eccentricity, and latus rectum of the ellipse given by the equation .

Step 1: Identify the values of and

Comparing the given equation with the standard form of an ellipse , we have:

and

Therefore, and .

Step 2: Determine the orientation of the ellipse

Since , the major axis is along the x-axis.

Step 3: Calculate (distance from the center to each focus)

We use the relationship .

So,

Step 4: Find the coordinates of the foci

The foci are located at , which are .

Focus:

Step 5: Find the coordinates of the vertices

The vertices are located at , which are .

Vertices:

Step 6: Calculate the length of the major and minor axes

Length of the major axis =

Length of the minor axis =

Major axis =

Minor axis =

Step 7: Calculate the eccentricity

The eccentricity is given by

Eccentricity:

Step 8: Calculate the length of the latus rectum

The length of the latus rectum is given by

Latus rectum =

ANSWER

Focus: F(± √13, 0)

Vertices: V(± 7, 0)

Major axis = 14

Minor axis = 12

Eccentricity: e = √137

Latus rectum = (72)/(7)

Question 6

QUESTION

In each of the Exercises 1 to 9, find the coordinates of the foci, the vertices, the length of the major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

For the ellipse (x^2)/(100) + (y^2)/(400) = 1.

SOLUTION

We are given the equation of an ellipse and asked to find its foci, vertices, major and minor axes lengths, eccentricity, and latus rectum length.

Step 1: Identify the type of ellipse

The given equation is . Since , the major axis is along the y-axis. We can rewrite the equation as . Therefore, and .

Step 2: Find the coordinates of the vertices

Since the major axis is along the y-axis, the vertices are at . Thus, the vertices are .

Step 3: Calculate

We know that . Substituting the values of and , we get:

Therefore, .

Step 4: Find the coordinates of the foci

Since the major axis is along the y-axis, the foci are at . Thus, the foci are .

Step 5: Calculate the lengths of the major and minor axes

The length of the major axis is .

The length of the minor axis is .

Step 6: Calculate the eccentricity

The eccentricity is given by .

Step 7: Calculate the length of the latus rectum

The length of the latus rectum is given by .

Final Answer:

Focus:

Vertices:

Major axis =

Minor axis =

Eccentricity:

Latus rectum =

ANSWER

Focus: F(0, ± 10√3)

Vertices: V(0, ± 20)

Major axis = 40

Minor axis = 20

Eccentricity: e = √32

Latus rectum = 10

Question 7

QUESTION

In each of the Exercises 1 to 9, find the coordinates of the foci, the vertices, the length of the major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

For the ellipse 36x^2 + 4y^2 = 144.

SOLUTION

We are asked to find the foci, vertices, length of the major and minor axes, eccentricity, and latus rectum of the ellipse given by the equation .

Step 1: Rewrite the equation in standard form

Divide both sides of the equation by 144:

Simplify:

This is the standard form of an ellipse: , where and . Since , this is a vertical ellipse.

Step 2: Identify a and b

From , we get .

From , we get .

Step 3: Calculate c (distance from center to focus)

For an ellipse, .

Step 4: Determine the foci

Since it's a vertical ellipse, the foci are at , which are .

Focus:

Step 5: Determine the vertices

For a vertical ellipse, the vertices are at , which are .

Vertices:

Step 6: Calculate the length of the major and minor axes

Major axis length =

Minor axis length =

Major axis =

Minor axis =

Step 7: Calculate the eccentricity

Eccentricity,

Eccentricity:

Step 8: Calculate the length of the latus rectum

Length of latus rectum =

Latus rectum =

ANSWER

Focus: F(0, ± 4√2)

Vertices: V(0, ± 6)

Major axis = 12

Minor axis = 4

Eccentricity: e = 2√23

Latus rectum = (4)/(3)

Question 8

QUESTION

In each of the Exercises 1 to 9, find the coordinates of the foci, the vertices, the length of the major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

For the ellipse 16x^2 + y^2 = 16.

SOLUTION

We are asked to find the foci, vertices, length of major and minor axes, eccentricity, and length of the latus rectum for the ellipse .

Step 1: Rewrite the equation in standard form

To get the standard form of the ellipse equation, we divide both sides by 16:

This is the standard form of an ellipse with the major axis along the y-axis.

Step 2: Identify and

Comparing with the standard form (since), we have:

and

Therefore, and .

Step 3: Calculate

We know that . So,

Step 4: Find the coordinates of the foci

Since the major axis is along the y-axis, the foci are at . Therefore, the foci are .

Step 5: Find the coordinates of the vertices

The vertices are at . Therefore, the vertices are .

Step 6: Find the length of the major and minor axes

Length of the major axis =

Length of the minor axis =

Step 7: Calculate the eccentricity

Eccentricity,

Step 8: Calculate the length of the latus rectum

Length of the latus rectum =

Focus:

Vertices:

Major axis =

Minor axis =

Eccentricity:

Latus rectum =

ANSWER

Focus: F(0, ± √15)

Vertices: V(0, ± 4)

Major axis = 8

Minor axis = 2

Eccentricity: e = √154

Latus rectum = (1)/(2)

Question 9

QUESTION

In each of the Exercises 1 to 9, find the coordinates of the foci, the vertices, the length of the major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse.

For the ellipse 4x^2 + 9y^2 = 36.

SOLUTION

We are asked to find the foci, vertices, length of major and minor axes, eccentricity, and length of the latus rectum for the ellipse given by the equation .

Step 1: Rewrite the equation in standard form

Divide both sides of the equation by 36 to get the standard form of the ellipse equation:

This is in the form , where and . Since , the major axis is along the x-axis.

Step 2: Determine the values of a and b

Taking the square root, we get and .

Step 3: Calculate the coordinates of the vertices

The vertices are located at , so the vertices are .

Step 4: Calculate the length of the major and minor axes

Length of the major axis = .

Length of the minor axis = .

Step 5: Calculate the eccentricity (e)

We know that . So, .

Step 6: Calculate the coordinates of the foci

The foci are located at . So, .

The foci are .

Step 7: Calculate the length of the latus rectum

The length of the latus rectum is given by .

Final Answer:

Focus:

Vertices:

Major axis =

Minor axis =

Eccentricity:

Latus rectum =

ANSWER

Focus: F(± √5, 0)

Vertices: V(± 3, 0)

Major axis = 6

Minor axis = 4

Eccentricity: e = √53

Latus rectum = (8)/(3)

Question 10

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

Vertices (± 5, 0) and foci (± 4, 0).

SOLUTION

We are asked to find the equation of an ellipse given its vertices and foci.

Step 1: Identify the type of ellipse

Since the vertices are and the foci are , both lie on the x-axis. This means the major axis is along the x-axis, and the ellipse is of the form: where .

Step 2: Determine the value of 'a'

The vertices are at . Given the vertices are , we have . Therefore, .

Step 3: Determine the value of 'c'

The foci are at . Given the foci are , we have . Therefore, .

Step 4: Find the value of 'b'

We know the relationship between , , and for an ellipse is: We can rearrange this to solve for : Substituting the values of and , we get: Therefore, .

Step 5: Write the equation of the ellipse

Now that we have and , we can write the equation of the ellipse as:

Final Answer:

ANSWER

(x^2)/(25) + (y^2)/(9) = 1

Question 11

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

Vertices (0, ± 13) and foci (0, ± 5).

SOLUTION

We are given the vertices and foci of an ellipse and asked to find its equation. The vertices and foci lie on the y-axis, indicating a vertical major axis.

Step 1: Identify the type of ellipse

Since the vertices are and foci are , the major axis is along the y-axis. The standard form of the ellipse equation is: where .

Step 2: Determine the values of a and c

The vertices are at , so . The foci are at , so .

Step 3: Find the value of b

We know the relationship between , , and for an ellipse is: Substituting the values of and :

Step 4: Write the equation of the ellipse

Now that we have and , we can write the equation of the ellipse:

Final Answer: The equation of the ellipse is .

ANSWER

(x^2)/(144) + (y^2)/(169) = 1

Question 12

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

Vertices (± 6, 0) and foci (± 4, 0).

SOLUTION

We are asked to find the equation of an ellipse given its vertices and foci.

Step 1: Identify the type of ellipse

Since the vertices are and the foci are , both lie on the x-axis. This indicates that the major axis is along the x-axis. Therefore, the equation of the ellipse is of the form:

where .

Step 2: Determine the value of 'a'

The vertices are given as . For an ellipse with its major axis along the x-axis, the vertices are located at . Therefore, we can deduce that:

So, .

Step 3: Determine the value of 'c'

The foci are given as . For an ellipse with its major axis along the x-axis, the foci are located at . Therefore, we can deduce that:

So, .

Step 4: Find the value of 'b'

We know the relationship between , , and for an ellipse is given by:

Substituting the values of and , we get:

Rearranging to solve for :

Step 5: Write the equation of the ellipse

Now that we have the values of and , we can write the equation of the ellipse as:

Final Answer: The equation of the ellipse is .

ANSWER

(x^2)/(36) + (y^2)/(20) = 1

Question 13

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

Ends of major axis (± 3, 0) and ends of minor axis (0, ± 2).

SOLUTION

We are asked to find the equation of an ellipse given the ends of its major and minor axes.

Step 1: Identify the given information

The ends of the major axis are . This tells us that the major axis lies along the x-axis and the length of the semi-major axis, , is 3.

The ends of the minor axis are . This tells us that the minor axis lies along the y-axis and the length of the semi-minor axis, , is 2.

Step 2: Recall the standard equation of an ellipse

Since the major axis is along the x-axis, the standard equation of the ellipse is:

Step 3: Substitute the values of and

We have and . Substituting these values into the standard equation, we get:

Step 4: Simplify the equation

Simplifying the equation, we have:

Final Answer:

The equation of the ellipse is .

ANSWER

(x^2)/(9) + (y^2)/(4) = 1

Question 14

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

Ends of major axis (0, ± √5) and ends of minor axis (± 1, 0).

SOLUTION

We are asked to find the equation of an ellipse given the ends of its major and minor axes.

Step 1: Identify the given information

The ends of the major axis are . This tells us that the major axis lies along the y-axis, and the length of the semi-major axis, , is .

The ends of the minor axis are . This tells us that the minor axis lies along the x-axis, and the length of the semi-minor axis, , is .

Step 2: Recall the standard equation of an ellipse

Since the major axis is along the y-axis, the equation of the ellipse is of the form:

Step 3: Substitute the values of a and b

We have and . Substituting these values into the equation, we get:

Step 4: Simplify the equation

Simplifying the equation, we have:

Final Answer:

The equation of the ellipse is .

ANSWER

(x^2)/(1) + (y^2)/(5) = 1

Question 15

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

Length of major axis 26 and foci (± 5, 0).

SOLUTION

We are asked to find the equation of an ellipse given the length of the major axis and the foci.

Step 1: Identify the given information

Length of major axis = . Since the length of the major axis is , we have , which gives us .

Foci are . This tells us that the ellipse is centered at the origin and the foci lie on the x-axis. Therefore, the equation of the ellipse is of the form , where .

Also, the coordinates of the foci are , so .

Step 2: Find the value of

We know the relationship between , , and for an ellipse is .

Substituting the values of and , we get:

Step 3: Write the equation of the ellipse

Now that we have the values of and , we can write the equation of the ellipse as:

Final Answer: The equation of the ellipse is .

ANSWER

(x^2)/(169) + (y^2)/(144) = 1

Question 16

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

Length of minor axis 16 and foci (0, ± 6).

SOLUTION

We are asked to find the equation of an ellipse given the length of the minor axis and the location of the foci.

Step 1: Identify the given information.

We are given that the length of the minor axis is 16, which means , so . The foci are at , which means . Since the foci are on the y-axis, this is a vertical ellipse.

Step 2: Recall the relationship between , , and for an ellipse.

For an ellipse, the relationship between the semi-major axis , the semi-minor axis , and the distance from the center to the foci is given by:

Step 3: Solve for .

We know and , so we can substitute these values into the equation:

Step 4: Write the equation of the ellipse.

Since the ellipse is vertical (foci on the y-axis) and centered at the origin, its equation is of the form:

We have and . Substituting these values, we get:

Final Answer: The equation of the ellipse is .

ANSWER

(x^2)/(64) + (y^2)/(100) = 1

Question 17

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

Foci (± 3, 0) with a = 4.

SOLUTION

We are asked to find the equation of an ellipse given its foci and the value of , the semi-major axis.

Step 1: Identify the given information

The foci are , which means the ellipse is centered at the origin and the major axis is along the x-axis. Also, , where is the distance from the center to each focus.

We are also given that , where is the length of the semi-major axis.

Step 2: Recall the relationship between a, b, and c for an ellipse

For an ellipse, the relationship between , (the semi-minor axis), and is given by:

Step 3: Calculate

We have and , so and . Substituting these values into the equation:

Solving for :

Step 4: Write the equation of the ellipse

Since the major axis is along the x-axis and the ellipse is centered at the origin, the equation of the ellipse is given by:

Substituting the values of and , we get:

Final Answer: The equation of the ellipse is .

ANSWER

(x^2)/(16) + (y^2)/(7) = 1

Question 18

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

b = 3, c = 4, centre at the origin and foci on the x-axis.

SOLUTION

We are asked to find the equation of an ellipse given , , the center at the origin, and the foci on the x-axis. Here, is the semi-minor axis and is the distance from the center to each focus.

Step 1: Recall the standard equation of an ellipse with center at the origin and foci on the x-axis.

The standard equation is: where is the semi-major axis and is the semi-minor axis.

Step 2: Use the relationship between , , and .

For an ellipse, the relationship is:

Step 3: Substitute the given values of and into the equation.

We have and , so:

Step 4: Find the value of .

Taking the square root of both sides, we get:

Step 5: Substitute the values of and into the standard equation of the ellipse.

We have and . Therefore, the equation of the ellipse is:

Final Answer: The equation of the ellipse is .

ANSWER

(x^2)/(25) + (y^2)/(9) = 1

Question 19

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

Centre at (0, 0), major axis on the y-axis and passes through the points (3, 2) and (1, 6).

SOLUTION

We are asked to find the equation of an ellipse centered at the origin, with its major axis along the y-axis, and passing through the points (3, 2) and (1, 6).

Step 1: General Equation of the Ellipse

Since the major axis is along the y-axis and the center is at (0, 0), the general equation of the ellipse is:

where .

Step 2: Use the given points to form equations

The ellipse passes through (3, 2) and (1, 6). Substitute these points into the ellipse equation:

For (3, 2):

For (1, 6):

Step 3: Solve the system of equations

Let and . Then our equations become:

Multiply the second equation by 9:

Subtract the first equation from this new equation:

Substitute into :

Step 4: Find and

Since , .

Since , .

Step 5: Write the equation of the ellipse

Substitute and into the general equation:

Final Answer: The equation of the ellipse is .

ANSWER

(x^2)/(10) + (y^2)/(40) = 1

Question 20

QUESTION

In each of the following Exercises 10 to 20, find the equation for the ellipse that satisfies the given conditions.

Major axis on the x-axis and passes through the points (4, 3) and (6, 2).

SOLUTION

We are asked to find the equation of an ellipse whose major axis lies along the x-axis and which passes through the points (4, 3) and (6, 2).

Step 1: Recall the standard equation of an ellipse with a major axis along the x-axis.

The standard equation of such an ellipse is: where is the semi-major axis and is the semi-minor axis.

Step 2: Use the given points to form equations.

Since the ellipse passes through (4, 3) and (6, 2), these points must satisfy the ellipse's equation. Substituting these points into the equation, we get:

For (4, 3):

For (6, 2):

Step 3: Solve the system of equations.

Let and . Then our equations become:

and

Multiply the first equation by 4 and the second by 9 to eliminate :

and

Subtract the first equation from the second:

Substitute into :

Step 4: Find and .

Since and , we have and .

Step 5: Write the equation of the ellipse.

Substituting the values of and into the standard equation, we get: Multiplying throughout by 52, we get .

Final Answer: or

ANSWER

x^2 + 4y^2 = 52 or (x^2)/(52) + (y^2)/(13) = 1

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🔢 Key Formulas

Important Formulas for Exercise 10.3: Parabola

Formula / Concept	Description
Definition of a Parabola	A parabola is the set of all points in a plane that are equidistant from a fixed line (the directrix) and a fixed point (the focus) not on the line.
Standard Equations	The four standard equations of a parabola are: 1. y^2 = 4ax (Opens right) 2. y^2 = -4ax (Opens left) 3. x^2 = 4ay (Opens up) 4. x^2 = -4ay (Opens down)
For Parabola y^2 = 4ax (a > 0)	• **Vertex:** (0, 0) • **Focus:** (a, 0) • **Equation of Directrix:** x = -a or x + a = 0 • **Axis of Symmetry:** y = 0 (x-axis) • **Length of Latus Rectum:** 4a • **Endpoints of Latus Rectum:** (a, 2a) and (a, -2a)
For Parabola y^2 = -4ax (a > 0)	• **Vertex:** (0, 0) • **Focus:** (-a, 0) • **Equation of Directrix:** x = a or x - a = 0 • **Axis of Symmetry:** y = 0 (x-axis)

Formula / Concept	Description
	• **Length of Latus Rectum:** 4a
For Parabola x^2 = 4ay (a > 0)	• **Vertex:** (0, 0) • **Focus:** (0, a) • **Equation of Directrix:** y = -a or y + a = 0 • **Axis of Symmetry:** x = 0 (y-axis) • **Length of Latus Rectum:** 4a
For Parabola x^2 = -4ay (a > 0)	• **Vertex:** (0, 0) • **Focus:** (0, -a) • **Equation of Directrix:** y = a or y - a = 0 • **Axis of Symmetry:** x = 0 (y-axis) • **Length of Latus Rectum:** 4a
Latus Rectum	The latus rectum of a parabola is a line segment that passes through the focus, is perpendicular to the axis of the parabola, and has its endpoints on the parabola. Its length is 4a.
Eccentricity (e)	For any parabola, the eccentricity is always 1 (e = 1). It is the ratio of the distance of a point on the parabola from the focus to its perpendicular distance from the directrix.

Top FAQs

Q1. How many questions are in NCERT Solutions Class 11 Maths Chapter 10 Conic Sections Exercise 10.3 for CBSE board exam 2025-26?

Exercise 10.3 of NCERT Solutions for Class 11 Maths Chapter 10 Conic Sections contains exactly 20 questions focused on parabola and its properties. These questions cover standard equations of parabola, focal chord properties, and coordinate geometry applications essential for CBSE board exam 2025-26.

Q2. Where can I download free PDF of NCERT Solutions for Class 11 Maths Chapter 10 Conic Sections Exercise 10.3 with step by step solutions?

Free PDF download of NCERT Solutions for Class 11 Maths Chapter 10 Conic Sections Exercise 10.3 with complete step by step solutions is available on official NCERT website and various educational platforms. These PDFs include detailed explanations for all 20 questions on parabola, updated according to CBSE syllabus 2025-26.

Q3. How many marks does Conic Sections Chapter 10 Exercise 10.3 carry in CBSE Class 11 Maths board exam 2025-26?

Conic Sections (Chapter 10) carries 5 marks weightage in CBSE Class 11 Maths board exam 2025-26 under Unit III - Coordinate Geometry. Exercise 10.3 focusing on parabola is crucial as questions from standard equations and focal properties frequently appear in the examination.

Q4. Which is the most difficult question in NCERT Solutions Class 11 Maths Chapter 10 Conic Sections Exercise 10.3 for CBSE 2025-26?

Questions 18-20 in Exercise 10.3 of NCERT Solutions Class 11 Maths Chapter 10 Conic Sections are considered most difficult as they involve complex applications of parabola equations and focal chord properties. These questions require thorough understanding of standard equations of conics and their derivations for CBSE board exam 2025-26.

Q5. What is Standard Equations of Conics covered in NCERT Solutions Class 11 Maths Chapter 10 Conic Sections Exercise 10.3?

Standard Equations of Conics in Exercise 10.3 specifically covers parabola equations: $y^2=4ax$, $y^2=-4ax$, $x^2=4ay$, and $x^2=-4ay$. NCERT Solutions for Class 11 Maths Chapter 10 Exercise 10.3 provides step by step solutions for finding focus, directrix, latus rectum, and axis of parabola using these standard forms for CBSE 2025-26.

More Exercises

Visit all exercises from Chapter 10:

EXERCISE 10.1 →

EXERCISE 10.2 →

EXERCISE 10.3 ✓ →

EXERCISE 10.4 →

Miscellaneous Exercise on Chapter 10 →

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