Important Questions for Class 11 Maths Chapter 11: Here are the important questions for Class 11 Maths Chapter 11 Conic Sections that cover important topics and help in mastering the concepts of conic sections.

Practicing these important questions helps students develop a deeper understanding of the geometry of conic sections, which is important for scoring well in exams. These questions are designed to reinforce key concepts such as transformations, the relationship between the conic section and its parameters, and solving problems related to the tangents, normals, and asymptotes of conics.

Important Questions for Class 11 Maths Chapter 11 Overview

Here are the important questions for Class 11 Maths Chapter 11 Conic Sections are created by subject experts at Physics Wallah. This chapter introduces students to the fascinating world of conic sections, including the circle, ellipse, parabola, and hyperbola. These questions focus on understanding the derivations, standard forms, and properties of these conics.

By practicing these questions, students can enhance their problem-solving skills and conceptual clarity. This approach guided by the expert of Physics Wallah educators, ensures that students are well-prepared to tackle even the most challenging problems in exams.

Important Questions for Class 11 Maths Chapter 11 PDF

The Important Questions for Class 11 Maths Chapter 11 Conic Sections are available in the PDF link below.

The PDF is created to help students practice and strengthen their understanding of key concepts like the standard forms of conics, eccentricity, focus, and directrix. By working through these important questions, students can effectively prepare for exams and gain a deeper insight into the topic of conic sections.

Important Questions for Class 11 Maths Chapter 11 PDF

Important Questions for Class 11 Maths Chapter 11 Conic Sections

Here is the Important Questions for Class 11 Maths Chapter 11 Conic Sections-

Question 1:

Determine the equation of the circle with radius 4 and Centre (-2, 3).

Solution:

Given that:

Radius, r = 4, and center (h, k) = (-2, 3).

We know that the equation of a circle with centre (h, k) and radius r is given as

$(x – h)^2 + (y – k)^2 = r^2$ ….(1)

Now, substitute the radius and center values in (1), we get

Therefore, the equation of the circle is

$(x + 2)^2 + (y – 3)^2 = (4)^2$

$x^2 + 4x + 4 + y^2 – 6y + 9 = 16$

Now, simplify the above equation, we get:

$x^2 + y^2 + 4x – 6y – 3 = 0$

Thus, the equation of a circle with center (-2, 3) and radius 4 is $x^2 + y^2 + 4x – 6y – 3 = 0$

Question 2:

Compute the centre and radius of the circle $2x^2 + 2y^2 – x = 0$

Solution:

Given that, the circle equation is $2x^2 + 2y^2 – x = 0$

This can be written as:

$\Rightarrow (2x^2 - x) + y^2 = 0$

$\Rightarrow 2\{[x^2 – (x/2)] + y^2\} = 0$

$\Rightarrow \{ x^2 – 2x(¼) + (¼)^2\} + y^2 – (¼)^2 = 0$

Now, simplify the above form, we get

$\Rightarrow (x - (¼))^2 + (y-0)^2 = (¼)^2$

The above equation is of the form $(x – h)^2 + (y – k)^2 = r^2$

Therefore, by comparing the general form and the equation obtained, we can say

h= ¼ , k = 0, and r = ¼.

Question 3:

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

Solution:

Given that, the parabola equation is $y^2= -8x$.

It is noted that the coefficient of x is negative.

Therefore, the parabola opens towards the left.

Now, compare the equation with $y^2= -4ax$, we obtain

$-4a= -8$

$\Rightarrow a = 2$

Thus, the value of a is 2.

Therefore, the coordinates of the focus = (-a, 0) = (-2, 0)

Since the given equation involves y^2, the axis of the parabola is the x-axis.

Equation of directrix, x= a i.e., x = 2

We know the formula to find the length of a latus rectum

Latus rectum length= 4a

Now, substitute a = 2, we get

Length of latus rectum = 8

Question 4:

Determine the foci coordinates, the vertices, the length of the major axis, the minor axis, the eccentricity and the length of the latus rectum of the ellipse $(x^2/49) + (y^2/36) = 1$

Solution:

The given equation is $(x^2/49) + (y^2/36) = 1$

It can be written as $(x^2/7^2) + (y^2/6^2) = 1$

It is noticed that the denominator of $x^2/49$ is greater than the denominator of the $y^2/36$

On comparing the equation with $(x^2/a^2) + (y^2/b^2) = 1$, we will get

a= 7 and b = 6

Therefore, $c = \sqrt{(a^2 – b^2)}$

Now, substitute the value of a and b

$\Rightarrow \sqrt{(a^2 – b^2)} = \sqrt{(7^2 – 6^2)} = \sqrt{(49-36)}$

$\Rightarrow \sqrt{13}$

Hence, the foci coordinates are $(\pm \sqrt{13}, 0)$

Eccentricity, $e = c/a = \sqrt{13}/ 7$

Length of the major axis = 2a = 2(7) = 14

Length of the minor axis = 2b = 2(6) =12

The coordinates of the vertices are (± 7, 0)

Latus rectum Length= $2b^2/a = 2(6)^2/7 = 2(36)/7 = 72/7$

Question 5:

Determine the equation for the ellipse that satisfies the given conditions: Centre at (0, 0), the major axis on the y-axis and passes through the points (3, 2) and (1, 6).

Solution:

Centre = (0, 0), and major axis that passes through the points (3, 2) and (1, 6).

We know that the equation of the ellipse will be of the form when the centre is at (0, 0) and the major axis is on the y-axis,

$(x^2/b^2) + (y^2/a^2) = 1$ …. (1)

Here, a is the semi-major axis.

It is given that, the ellipse passes through the points (3, 2) and (1, 6).

Hence, equation (1) becomes

$(9/b^2) + (4/a^2) = 1$ …(2)

$(1/b^2) + (36/a^2) = 1$ …(3)

Solving equation (2) and (3), we get

$b^2 = 10$ and $a^2 = 40$

Therefore, the equation of the ellipse becomes: $(x^2/10) + (y^2/40) = 1$

Question 6:

Determine the equation of the hyperbola which satisfies the given conditions: Foci (0, ±13), the conjugate axis is of length 24.

Solution:

Given that: Foci (0, ±13), Conjugate axis length = 24

It is noted that the foci are on the y-axis.

Therefore, the equation of the hyperbola is of the form:

$(y^2/a^2)-(x^2/b^2) = 1$ …(1)

Since the foci are (0, ±13), we can get

C = 13

It is given that, the length of the conjugate axis is 24,

It becomes 2b = 24

b= 24/2

b= 12

And, we know that $a^2 + b^2 = c^2$

To find a, substitute the value of b and c in the above equation:

$a^2 + 12^2 = 13^2$

$a^2 = 169-144$

$a^2 = 25$

Now, substitute the value of a and b in equation (1), we get

$(y^2/25)-(x^2/144) = 1$, which is the required equation of the hyperbola.

Benefits of Practicing Important Questions for Class 11 Maths Chapter 11

Practicing **Important Questions for Class 11 Maths Chapter 11 - Conic Sections** offers several benefits for students:

In-Depth Understanding: These questions are designed to cover all key concepts, such as the equations and properties of conic sections, including ellipses, parabolas, and hyperbolas. By solving them, students gain a deeper understanding of the topic.

Improved Problem-Solving Skills: Regular practice enhances problem-solving abilities and helps students learn how to approach different types of questions, building confidence in their mathematical skills.

Exam Preparation: The questions mirror the type and format of those that typically appear in exams, providing students with the opportunity to familiarize themselves with the exam structure. This can reduce anxiety and improve time management during exams.

Clarifying Doubts: Practicing these questions enables students to identify areas where they may have weaknesses or doubts. By focusing on these areas, they can improve their conceptual clarity.

Boosts Performance: Consistent practice helps reinforce knowledge and refine skills, ultimately leading to better performance in the board exams. It also helps in scoring higher marks by covering all important topics.