Important Questions for Class 11 Maths Chapter 10: Here are the important questions for Class 11 Maths Chapter 10 Straight Lines that students should focus on. This chapter is important for understanding the fundamentals of coordinate geometry.

Students may be required to calculate the slope of a line, find the distance between a point and a line, or solve problems related to the angle between two lines. Mastery of concepts like the relationship between the slopes of parallel and perpendicular lines, as well as the geometric interpretation of lines, is essential for solving these problems.

Important Questions for Class 11 Maths Chapter 10 Overview

These important questions for Class 11 Maths Chapter 10 Straight Lines are created by subject experts at Physics Wallah. The chapter focuses on the fundamentals of coordinate geometry, and understanding the equations of straight lines. The questions include topics like the various forms of the equation of a line (point-slope form, slope-intercept form, and general form), calculating slopes, finding the distance between a point and a line, and understanding the conditions for parallel and perpendicular lines.

By practicing these questions, students can gain a deeper understanding of straight lines and improve their problem-solving skills.

Important Questions for Class 11 Maths Chapter 10 PDF

The Important Questions for Class 11 Maths Chapter 10 Straight Lines PDF is available below for students to download.

By practicing these questions students can enhance their understanding and boost their preparation for the upcoming exams. Download the PDF now and get started on mastering the chapter.

Important Questions for Class 11 Maths Chapter 10 PDF

Important Questions for Class 11 Maths Chapter 10 Straight Lines

Here is the Important Questions for Class 11 Maths Chapter 10 Straight Lines-

Question 1:

Calculate the slope of a line, that passes through the origin, and the mid-point of the segment joining the points P (0, -4) and B (8, 0).

Solution:

Given that,

The coordinates of the mid-point of the line segment joining the points P (0, -4) and B (8, 0) are:

[(0+8)/2 , (-4+0)/2] = (4, -2)

It is known that the slope (m) of a non-vertical line passing through the points (x_1, y_1) and (x_2, y_2) is given by the formula

$m = (y_2 - y_1) / ((x_2 - x_1)$, where ($x_2$ is not equal to x_1)

Therefore, the slope of the line passing through the points (0, 0,) and (4, -2) is

m= (-2-0)/(4-0)

m= -2/4

m= -½

Hence, the required slope of the line is -1/2

Question 2:

Find the equation of the line which is at a perpendicular distance of 5 units from the origin and the angle made by the perpendicular with the positive x-axis is 30°.

Solution:

If p is the length of the normal from the origin to a line and ω is the angle made by the normal with the positive direction of the x-axis

Then, the equation of the line for the given condition is written by

x cos ω + y sin ω = p.

Here, p = 5 units and ω = 30°

Thus, the required equation of the given line is

x cos 30°+ y sin 30° = 5

$x(\sqrt{3}/2) + y(½) = 5$

It becomes

$\sqrt{}\ 3x + y = 10$

Thus, the required equation of a line is $\sqrt{}\ 3x + y = 10$

Question 3:

Find the equation of the line perpendicular to the line $x – 7y + 5 = 0$ and having x-intercept 3

Solution:

The equation of the line is given as $x – 7y + 5 = 0$.

The above equation can be written in the form $y = mx+c$

Thus, the above equation is written as:

$y= (1/7)x + (5/7)$

From the above equation, we can say that,

The slope of a line, $m = 5/7$

The slope of the line perpendicular to the line having a slope of 1/7 is

$m = -1/(1/7) = -7$

Hence, the equation of a line with slope -7 and intercept 3 is given as:

$y = m (x – d)$

$\Rightarrow y= -7(x-3)$

$\Rightarrow y=-7x + 21$

$7x+ y = 21$

Hence, the equation of a line which is perpendicular to the line $x – 7y + 5 = 0$ with x-intercept 3 is $7x+ y = 21$.

Question 4:

The perpendicular from the origin to the line $y = mx + c$ meets it at the point (-1, 2). Find the values of m and c.

Solution:

The given equation of the line is y = mx + c.

From the given condition, the perpendicular from the origin meets the given line at (-1, 2).

Hence, the line joining the points (0, 0) and (-1, 2) is perpendicular to the given line.

The slope of the line joining (0, 0) and (-1, 2) is

= 2/-1 = -2

Therefore,

m (– 2) = -1 (Since the two lines are perpendicular)

m= ½

Since points (-1, 2) lies on the given line, it satisfies the equation y = mx + c.

Now, substitute the value of m, (x, y) coordinates in the equation:

2 = m(-1) + c

2 = ½(-1) + c

2 = -½ + c

C = 2 + (½)

C = 5/2

Therefore, the value of m and c are ½ and 5/2 respectively.

Question 5:

Find the points on the x-axis whose distance from the line equation (x/3) + (y/4) = 1 is given as 4units.

Solution:

Given that,

The equation of a line = (x/3) + (y/4) = 1

It can be written as:

4x + 3y -12 = 0 …(1)

Compare the equation (1) with general line equation $Ax + By + C = 0$,

we get the values $A = 4$, $B = 3$, and $C = -12$.

Let $(a, 0)$ be the point on the x-axis whose distance from the given line is 4 units.

we know that the perpendicular distance (d) of a line $Ax + By + C = 0$ from a point (x_1, y_1) is given by

$D = |Ax_1+By_1 + C|/ \sqrt{A^2 + B^2}$

Now, substitute the values in the above formula, we get:

$4 = |4a+0 + -12|/ \sqrt{4^2 + 3^2}$

$\Rightarrow 4 = |4a-12|/5$

$\Rightarrow |4a-12| = 20$

$\Rightarrow \pm (4a-12)= 20$

$\Rightarrow (4a-12)= 20$ or $-(4a-12) =20$

Therefore, it can be written as:

$(4a-12)= 20$

$4a = 20+12$

$4a = 32$

$a = 8$

(or)

$-(4a-12) =20$

$-4a +12 =20$

$-4a = 20-12$

$-4a= 8$

$a= -2$

$\Rightarrow a= 8$ or -2

Hence, the required points on x axis are $(-2, 0)$ and $(8, 0)$.

Benefits of Practicing Important Questions for Class 11 Maths Chapter 10 Straight Lines

Practicing Important Questions for Class 11 Maths Chapter 10 Straight Lines provide several benefits for students:

Concept Reinforcement: By solving a variety of questions, students can solidify their understanding of key concepts such as slope, distance formula, equations of lines, and various forms like point-slope and intercept form.

Improved Problem-Solving Skills: Regular practice helps develop strong problem-solving techniques and the ability to approach different types of questions with ease and confidence.

Exam Readiness: The questions in this chapter often appear in exams. Practicing them helps students familiarize themselves with the question format and improve their time management skills during the exam.

Increased Speed and Accuracy: Repeated practice boosts calculation speed and accuracy, enabling students to solve problems quickly without making mistakes which is important in a time-bound exam.

Comprehensive Coverage: Important questions cover all topics in the chapter, ensuring no concept is left out and helping students tackle both straightforward and complex problems effectively.

Boosts Confidence: Solving these questions gives students the confidence to handle any challenge that might appear in the actual exam.