Important Questions for Class 11 Maths Chapter 5: Important Questions for Class 11 Maths Chapter 5 Complex Numbers and Quadratic Equations focuses on key concepts that are fundamental in advanced mathematics. This chapter introduces complex numbers, imaginary units, and their properties, as well as the methods to solve quadratic equations with complex roots.

Practicing these questions helps students gain a strong understanding of complex numbers and the quadratic formula which are not only important for Class 11 exams but also for higher-level mathematics in future classes. These questions are created to build confidence, improve problem-solving skills and prepare students for competitive exams.

Important Questions for Class 11 Maths Chapter 5 Overview

Important Questions for Class 11 Maths Chapter 5 Complex Numbers and Quadratic Equations, created by subject experts at Physics Wallah provide a detailed overview of this important topic.

These questions guide students through concepts that are foundational for advanced math, ensuring they develop both accuracy and confidence in problem-solving. Ideal for exam preparation, this set of questions not only reinforces key ideas but also helps students practice and apply concepts to various types of problems.

Important Questions for Class 11 Maths Chapter 5 PDF

Important Questions for Class 11 Maths Chapter 5 PDF provide a valuable resource for mastering complex numbers and quadratic equations.

By working through these questions students can enhance their understanding, accuracy and confidence making them better prepared for exams. Download the PDF from the link below to start practicing and strengthen your grasp on Chapter 5.

Important Questions for Class 11 Maths Chapter 5 PDF

Important Questions for Class 11 Maths Chapter 5 Complex Numbers and Quadratic Equations

Here is the Important Questions for Class 11 Maths Chapter 5 Complex Numbers and Quadratic Equations-

Question 1:

Write the given complex number $(1 – i) – (–1 + i6)$ in the form $a + ib$

Solution:

Given Complex number: $(1 – i) – (–1 + i6)$

Multiply (-) by the term inside the second bracket $(–1 + i6)$

$= 1 – i +1 – i6$

$= 2 – 7i$, which is of the form $a + ib$.

Question 2:

Express the given complex number (-3) in the polar form.

Solution:

Given, complex number is -3.

Let $r \cos \theta = -3$ …(1)

and $r \sin \theta = 0$ …(2)

Squaring and adding (1) and (2), we get

$r^2\cos^2\theta + r^2\sin^2\theta = (-3)^2$

Take r^2 outside from L.H.S, we get

$r^2(\cos^2\theta + \sin^2\theta) = 9$

We know that, $\cos^2\theta + \sin^2\theta = 1$, then the above equation becomes,

$r^2 = 9$

$r = 3$ (Conventionally, $r > 0$)

Now, subsbtitute the value of r in (1) and (2)

$3 \cos \theta = -3$ and $3 \sin \theta = 0$

$\cos \theta = -1$ and $\sin \theta = 0$

Therefore, $\theta = \pi$

Hence, the polar representation is,

$-3 = r \cos \theta + i\, r \sin \theta$

$3 \cos \pi + 3 \sin \pi = 3(\cos \pi + i \sin \pi)$

Thus, the required polar form is $3 \cos \pi + 3i \sin \pi = 3(\cos \pi + i \sin \pi)$

Question 3:

Solve the given quadratic equation $2x^2 + x + 1 = 0$.

Solution:

Given quadratic equation: $2x^2 + x + 1 = 0$

Now, compare the given quadratic equation with the general form $ax^2 + bx + c = 0$

On comparing, we get

$a = 2$, $b = 1$ and $c = 1$

Therefore, the discriminant of the equation is:

$D = b^2 – 4ac$

Now, substitute the values in the above formula

$D = (1)^2 – 4(2)(1)$

$D = 1- 8$

$D = -7$

Therefore, the required solution for the given quadratic equation is

$x =[-b \pm \sqrt{D}]/2a$

$x = [-1 \pm \sqrt{-7}]/2(2)$

We know that, $\sqrt{-1} = i$

$x = [-1 \pm \sqrt{7}i] / 4$

Hence, the solution for the given quadratic equation is $(-1 \pm \sqrt{7}i) / 4$.

Question 4:

For any two complex numbers z_1 and z_2, show that $Re(z_1z_2) = Rez_1\ Rez_2 – Imz_1Imz_2$

Solution:

Given: z_1 and z_2 are the two complex numbers

To prove: $Re(z_1z_2) = Rez_1\ Rez_2 - Imz_1Imz_2$

Let $z_1 = x_1+iy_1$ and $z_2 = x_2+iy_2$

Now, $z_1\ z_2 =(x_1+iy_1)(x_2+iy_2)$

Now, split the real part and the imaginary part from the above equation:

$\Rightarrow x_1(x_2+iy_2) +iy_1(x_2+iy_2)$

Now, multiply the terms:

$= x_1x_2+ix_1y_2+ix_2y_1+i^2y_1y_2$

We know that, $i^2 = -1$, then we get

$= x_1x_2+ix_1y_2+ix_2y_1-y_1y_2$

Now, again seperate the real and the imaginary part:

$= (x_1x_2 -y_1y_2) +i\ (x_1y_2+x_2y_1)$

From the above equation, take only the real part:

$\Rightarrow Re\ (z_1z_2) =(x_1x_2 -y_1y_2)$

It means that,

$\Rightarrow Re(z_1z_2) = Rez_1\ Rez_2- Imz_1Imz_2$

Hence, the given statement is proved.

Question 5:

Find the modulus of [(1+i)/(1-i)] – [(1-i)/(1+i)]

Solution:

Given: [(1+i)/(1-i)] – [(1-i)/(1+i)]

Simplify the given expression, we get:

$[(1+i)/(1-i)] - [(1-i)/(1+i)] = [(1+i)^2- (1-i)^2]/ [(1+i)(1-i)]$

$= (1+i^2+2i-1-i^2+2i)) / (1^2+1^2)$

Now, cancel out the terms,

$= 4i/2$

$= 2i$

Now, take the modulus,

$| [(1+i)/(1-i)] – [(1-i)/(1+i)]| =|2i| = \sqrt{2^2} = 2$

Therefore, the modulus of [(1+i)/(1-i)] – [(1-i)/(1+i)] is 2.

Benefits of Solving Important Questions for Class 11 Maths Chapter 5 Complex Numbers and Quadratic Equations

Here are the benefits of solving Important Questions for Class 11 Maths Chapter 5 Complex Numbers and Quadratic Equations:

Enhances Understanding: Deepens knowledge of complex numbers, their properties and quadratic equations with complex roots.

Builds Problem-Solving Skills: Provides practice with different question types, improving analytical and problem-solving abilities.

Prepares for Exams: Familiarizes students with exam-style questions, boosting readiness for Class 11 exams.

Improves Accuracy and Speed: Regular practice increases precision and helps solve problems faster.

Strengthens Foundation for Advanced Math: Establishes a strong base for more complex topics in higher grades and competitive exams.

Boosts Confidence: Tackling a variety of questions increases confidence in handling complex number and quadratic equation problems.