ICSE Class 10 Maths Selina Solutions Chapter 8: ICSE Class 10 Maths Selina Solutions for Chapter 8 Remainder and Factor Theorems provide a detailed guide to understanding and applying these crucial algebraic concepts.

With clear step-by-step explanations and examples these solutions simplify complex problems, making it easier for students to solve them accurately. By practicing these solutions students can enhance their problem-solving skills and build a strong foundation in algebra which is important for their academic success in mathematics.

ICSE Class 10 Maths Selina Solutions Chapter 8 Remainder and Factor Theorems Overview

These solutions are prepared by subject experts from Physics Wallah for ICSE Class 10 Maths Selina Solutions Chapter 8 Remainder and Factor Theorems. They give clear and detailed explanations, showing step-by-step how to solve problems about remainders and factors of polynomial expressions.

This helps students learn these important math concepts well. By using these solutions, students can improve their problem-solving skills and gain confidence in solving algebra problems.

ICSE Class 10 Maths Selina Solutions Chapter 8 PDF

The PDF link for the ICSE Class 10 Maths Selina Solutions Chapter 8 Remainder and Factor Theorems is available below.

By accessing this PDF, students can enhance their learning experience and effectively prepare for their exams.

ICSE Class 10 Maths Selina Solutions Chapter 8 PDF

ICSE Class 10 Maths Selina Solutions Chapter 8 Remainder and Factor Theorems

Below we have provided ICSE Class 10 Maths Selina Solutions Chapter 8 for the ease of the students –

1. Show that (x – 1) is a factor of $x^3 - 7x^2 + 14x - 8$. Hence, completely factorise the given expression.

Solution:

Let f(x) = $x^3 - 7x^2 + 14x - 8$

Then, for x = 1

$f(1) = (1)^3 - 7(1)^2 + 14(1) - 8 = 1 - 7 + 14 - 8 = 0$

Thus, (x – 1) is a factor of f(x).

Now, performing long division we have

$$
\begin{array}{r|l}
 & x^2 - 6x + 8 \\
\hline
x - 1 & x^3 - 7x^2 + 14x - 8 \\
 & x^3 - x^2 \\
\hline
 & \quad -6x^2 + 14x - 8 \\
 & \quad -6x^2 + 6x \\
\hline
 & \qquad\qquad 8x - 8 \\
 & \qquad\qquad 8x - 8 \\
\hline
 & \qquad\qquad\qquad 0
\end{array}
$$

Hence, $f(x) = (x - 1)(x^2 - 6x + 8)$

$= (x - 1)(x^2 - 4x - 2x + 8)$

$= (x - 1)[x(x - 4) - 2(x - 4)]$

$= (x - 1)(x - 4)(x - 2)$

2. Using Remainder Theorem, factorise:

$x^3 + 10x^2 - 37x + 26$ completely.

Solution:

Let f(x) = $x^3 + 10x^2 - 37x + 26$

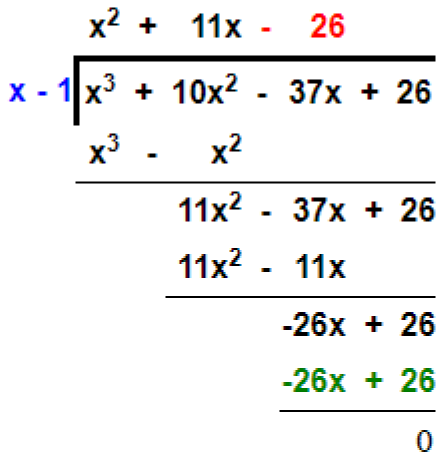
From remainder theorem, we know that

For x = 1, the value of f(x) is the remainder

$f(1) = (1)^3 + 10(1)^2 - 37(1) + 26 = 1 + 10 - 37 + 26 = 0$

As f(1) = 0, x – 1 is a factor of f(x).

Now, performing long division we have



Thus, $f(x) = (x – 1) (x^2 + 11x – 26)$

$= (x – 1) (x^2 + 13x – 2x – 26)$

$= (x – 1) [x(x + 13) – 2(x + 13)]$

$= (x – 1) (x + 13) (x – 2)$

3. When $x^3 + 3x^2 – mx + 4$ is divided by $x – 2$, the remainder is $m + 3$. Find the value of m.

Solution:

Let $f(x) = x^3 + 3x^2 – mx + 4$

From the question, we have

$f(2) = m + 3$

$(2)^3 + 3(2)^2 – m(2) + 4 = m + 3$

$8 + 12 – 2m + 4 = m + 3$

$24 – 3 = m + 2m$

$3m = 21$

Thus, $m = 7$

4. What should be subtracted from $3x^3 – 8x^2 + 4x – 3$, so that the resulting expression has $x + 2$ as a factor?

Solution:

Let's assume the required number to be k.

And let $f(x) = 3x^3 – 8x^2 + 4x – 3 – k$

From the question, we have

$f(-2) = 0$

$3(-2)^3 – 8(-2)^2 + 4(-2) – 3 – k = 0$

$-24 – 32 – 8 – 3 – k = 0$

$-67 – k = 0$

$k = -67$

Therefore, the required number is -67.

5. If (x + 1) and (x – 2) are factors of $x^3 + (a + 1)x^2 – (b – 2)x – 6$, find the values of a and b. And then, factorise the given expression completely.

Solution:

Let's take $f(x) = x^3 + (a + 1)x^2 – (b – 2)x – 6$

As, (x + 1) is a factor of f(x).

Then, remainder = f(-1) = 0

$(-1)^3 + (a + 1)(-1)^2 – (b – 2) (-1) – 6 = 0$

$-1 + (a + 1) + (b – 2) – 6 = 0$

$a + b – 8 = 0$ … (1)

And as, (x – 2) is a factor of f(x).

Then, remainder = f(2) = 0

$(2)^3 + (a + 1) (2)^2 – (b – 2) (2) – 6 = 0$

$8 + 4a + 4 – 2b + 4 – 6 = 0$

$4a – 2b + 10 = 0$

$2a – b + 5 = 0$ … (2)

Adding (1) and (2), we get

3a – 3 = 0

Thus, a = 1

Substituting the value of a in (i), we get,

1 + b – 8 = 0

Thus, b = 7

Hence, f(x) = $x^3 + 2x^2 - 5x - 6$

Now as (x + 1) and (x – 2) are factors of f(x).

So, (x + 1) (x – 2) = $x^2 - x - 2$ is also a factor of f(x).

$$
\begin{array}{r|l}
 & x + 3 \\
\hline
x^2 - x - 2 & x^3 + 2x^2 - 5x - 6 \\
 & x^3 - x^2 - 2x \\
\hline
 & 3x^2 - 3x - 6 \\
 & 3x^2 - 3x - 6 \\
\hline
 & 0
\end{array}
$$

Therefore, f(x) = $x^3 + 2x^2 - 5x - 6$ = (x + 1) (x – 2) (x + 3)

6. If x – 2 is a factor of x^2 + ax + b and a + b = 1, find the values of a and b.

Solution:

Let f(x) = x^2 + ax + b

Given, (x – 2) is a factor of f(x).

Then, remainder = f(2) = 0

$(2)^2$ + a(2) + b = 0

4 + 2a + b = 0

2a + b = -4 … (1)

And also given that,

a + b = 1 … (2)

Subtracting (2) from (1), we have

a = -5

On substituting the value of a in (2), we have

b = 1 – (-5) = 6

7. Factorise $x^3 + 6x^2 + 11x + 6$ completely using factor theorem.

Solution:

Let $f(x) = x^3 + 6x^2 + 11x + 6$

For x = -1, the value of f(x) is

$f(-1) = (-1)^3 + 6(-1)^2 + 11(-1) + 6$

= -1 + 6 – 11 + 6 = 12 – 12 = 0

Thus, (x + 1) is a factor of f(x).

$$\begin{array}{r|llll} & x^2 & +\ 5x & +\ 6 & \\ \hline x+1 & x^3 & +\ 6x^2 & +\ 11x & +\ 6 \\ & x^3 & +\ x^2 & & \\ \hline & & 5x^2 & +\ 11x & +\ 6 \\ & & 5x^2 & +\ 5x & \\ \hline & & & 6x & +\ 6 \\ & & & 6x & +\ 6 \\ \hline & & & & 0 \end{array}$$

Therefore, $f(x) = (x + 1)(x^2 + 5x + 6)$

$= (x + 1)(x^2 + 3x + 2x + 6)$

= (x + 1) [x(x + 3) + 2(x + 3)]

= (x + 1) (x + 3) (x + 2)

8. Find the value of 'm', if $mx^3 + 2x^2 – 3$ and $x^2 – mx + 4$ leave the same remainder when each is divided by x – 2.

Solution:

Let $f(x) = mx^3 + 2x^2 – 3$ and $g(x) = x^2 – mx + 4$

From the question, it's given that f(x) and g(x) leave the same remainder when divided by (x – 2). So, we have:

$f(2) = g(2)$

$m(2)^3 + 2(2)^2 – 3 = (2)^2 – m(2) + 4$

$8m + 8 – 3 = 4 – 2m + 4$

$10m = 3$

Thus, $m = 3/10$

Benefits of ICSE Class 10 Maths Selina Solutions Chapter 8 Remainder and Factor Theorems

- **Clear Understanding:** These solutions help students grasp the concepts of Remainder and Factor Theorems in a simplified manner making it easier to understand and apply these theorems to various problems.
- **Step-by-Step Solutions:** The solutions are presented in a step-by-step format guiding students through each problem methodically. This approach helps in building a strong foundation in solving polynomial equations.
- **Exam Preparation:** With detailed explanations and numerous solved examples, these solutions serve as an excellent resource for exam preparation ensuring students are well-prepared for their tests.
- **Practice Questions:** The chapter includes a variety of practice questions that cover different difficulty levels. This allows students to test their understanding and improve their problem-solving skills.
- **Confidence Building:** By working through these solutions students can build confidence in their mathematical abilities helping them tackle more complex problems with ease.
- **Expert Guidance:** Prepared by subject experts from Physics Wallah, these solutions provide reliable and accurate methods for solving problems, ensuring that students learn the correct techniques.
- **Time Management:** Familiarity with the types of questions and the methods to solve them helps students manage their time efficiently during exams.

At Physics Wallah, we provide the best online coaching for Class 10 focusing on Online coaching class 10. Our courses are taught by well-known instructors, dedicated to enhancing conceptual understanding and problem-solving skills.