

NCERT Solutions Class 10 Maths

Chapter 2: Polynomials

EXERCISE 2.1

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Quick Summary: In NCERT Solutions Class 10 Maths Chapter 2 Exercise 2.1, students learn the geometrical meaning of zeroes of polynomials and their relationship with coefficients. This exercise covers fundamental concepts like finding zeroes graphically, understanding the division algorithm, and establishing connections between polynomial roots and their coefficients, which are essential for CBSE Class 10 board exams and competitive mathematics.

Key Takeaways:

- Zeroes of a polynomial $p(x)$ are the x -coordinates where the graph intersects the x -axis, i.e., where $p(x) = 0$
- For a quadratic polynomial $ax^2 + bx + c$, sum of zeroes = $-(b)/(a)$ and product of zeroes = $(c)/(a)$
- Division Algorithm: $p(x) = g(x) \times q(x) + r(x)$ where degree of $r(x) <$ degree of $g(x)$
- Graphical interpretation helps visualize polynomial behavior and solve real-world problems in CBSE examinations

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Question 1

QUESTION

The graphs of $y = p(x)$ are given in Fig. 2.10 for some polynomials $p(x)$. Find the number of zeroes of $p(x)$ in each case.

SOLUTION

This question tests the understanding of how the graph of a polynomial relates to its zeroes. The zeroes of a polynomial are the x -coordinates of the points where the graph intersects the x -axis.

(i) The graph does not intersect the x -axis at any point. Therefore, the number of zeroes is 0.

(ii) The graph intersects the x -axis at only 1 point. Therefore, the number of zeroes is 1.

(iii) The graph intersects the x -axis at 3 points. Therefore, the number of zeroes is 3.

(iv) The graph intersects the x -axis at 2 points. Therefore, the number of zeroes is 2.

(v) The graph intersects the x -axis at 4 points. Therefore, the number of zeroes is 4.

(vi) The graph intersects the x -axis at 3 points. Therefore, the number of zeroes is 3.

Final Answer:

(i) No zeroes

(ii) 1

(iii) 3

(iv) 2

(v) 4

(vi) 3

Conclusion: The number of zeroes of a polynomial is equal to the number of points where the graph intersects the x -axis. A common mistake is to count the points where the graph touches the y -axis, which are not the zeroes of the polynomial.

ANSWER

(i) No zeroes

(ii) 1

(iii) 3

(iv) 2

(v) 4

(vi) 3

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Key Formulas

Important Formulas for Chapter 2: Polynomials

Formula / Concept	Description
Zero of a Polynomial	A real number k is a zero of a polynomial $p(x)$ if $p(k) = 0$.
Geometrical Meaning of Zeroes	The zeroes of a polynomial $p(x)$ are the x -coordinates of the points where the graph of $y = p(x)$ intersects the x -axis. The number of times the graph intersects the x -axis is the number of real zeroes.
Degree 'n' Polynomial	A polynomial of degree n can have at most n zeroes.
Linear Polynomial: $p(x) = ax + b$	The graph is a straight line that intersects the x -axis at exactly one point. It has exactly one zero given by $-(b)/(a)$.
Quadratic Polynomial: $p(x) = ax^2 + bx + c$	The graph is a parabola. It can have at most two zeroes. The parabola opens upwards if $a > 0$ and downwards if $a < 0$.
Relationship between Zeroes and Coefficients (Quadratic)	If α and β are the zeroes of the quadratic polynomial $ax^2 + bx + c$, then: Sum of zeroes: $\alpha + \beta = -(b)/(a)$ Product of zeroes: $\alpha\beta = (c)/(a)$
Constructing a Quadratic Polynomial	A quadratic polynomial whose zeroes α and β are known is given by: $p(x) = k[x^2 - (\alpha + \beta)x + \alpha\beta]$, where k is any non-zero real number.

Formula / Concept	Description
Relationship between Zeroes and Coefficients (Cubic)	<p>If α, β, and γ are the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d$, then:</p> $\alpha + \beta + \gamma = -(b)/(a)$ $\alpha\beta + \beta\gamma + \gamma\alpha = (c)/(a)$ $\alpha\beta\gamma = -(d)/(a)$
Division Algorithm for Polynomials	<p>If $p(x)$ and $g(x)$ are any two polynomials with $g(x) \neq 0$, then we can find polynomials $q(x)$ and $r(x)$ such that:</p> $p(x) = g(x) \times q(x) + r(x)$ where $r(x) = 0$ or degree of $r(x) <$ degree of $g(x)$.

Top FAQs

Q1. How many questions are in NCERT Solutions Class 10 Maths Chapter 2 Polynomials Exercise 2.1 for CBSE board exam 2025-26?

Exercise 2.1 of NCERT Solutions for Class 10 Maths Chapter 2 Polynomials contains only 1 question focusing on the geometrical meaning of zeroes of a polynomial. This exercise is part of the Algebra unit and helps students understand the fundamental concept of polynomial graphs and their x-intercepts, which is crucial for CBSE board exam 2025-26 preparation.

Q2. Where can I download free PDF of NCERT Solutions for Class 10 Maths Chapter 2 Polynomials Exercise 2.1 with step by step solutions?

You can download the free PDF of NCERT Solutions for Class 10 Maths Chapter 2 Polynomials Exercise 2.1 from the official NCERT website or various educational platforms offering step by step solutions. These PDFs are updated as per the latest CBSE syllabus 2025-26 and include detailed explanations of the geometrical meaning of zeroes of polynomials for effective exam preparation.

Q3. How many marks does Polynomials Chapter 2 carry in CBSE Class 10 Maths board exam 2025-26 according to latest pattern?

Polynomials Chapter 2 carries approximately 5 marks in CBSE Class 10 Maths board exam 2025-26 as part of Unit II - Algebra. The questions from this chapter may appear in various formats including MCQs, short answer questions, and long answer questions testing concepts like relationship between zeroes and coefficients and division algorithm for polynomials.

Q4. Which is the most difficult question in Exercise 2.1 of NCERT Solutions Class 10 Maths Chapter 2 Polynomials?

Exercise 2.1 of NCERT Solutions Class 10 Maths Chapter 2 Polynomials has only 1 question that deals with understanding the geometrical meaning of zeroes of a polynomial. While not particularly difficult, this question requires conceptual clarity about how polynomial graphs intersect the x-axis and the significance of these intersection points, which forms the foundation for advanced polynomial concepts.

Q5. What is the Relationship between Zeroes and Coefficients in NCERT Solutions for Class 10 Maths Chapter 2 Polynomials Exercise 2.1?

The Relationship between Zeroes and Coefficients is a key concept in NCERT Class 10 Maths Chapter 2 Polynomials where for a quadratic polynomial ax^2+bx+c , the sum of zeroes equals $-b/a$ and product of zeroes equals c/a . Exercise 2.1 introduces the geometrical meaning of zeroes which builds the foundation for understanding this algebraic relationship covered in subsequent exercises, essential for CBSE board exam 2025-26.

More Exercises

Visit all exercises from Chapter 2:

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