

Polynomials - NCERT Examples

Examples 1-5 with independently verified solutions.

CHAPTER

Polynomials

RESOURCE

NCERT Examples

SOURCE

NCERT Mathematics, Reprint 2026-27

PART 1

Verified NCERT questions and solutions

Verified NCERT questions and solutions

Solutions are checked independently and follow the supplied NCERT chapter edition.

NCERT EXAMPLE

Example 1

geometrical meaning of zeroes · polynomial graphs

Look at the graphs in Figure 2.9. Each is the graph of $y = p(x)$, where $p(x)$ is a polynomial. For each graph, find the number of zeroes of $p(x)$.

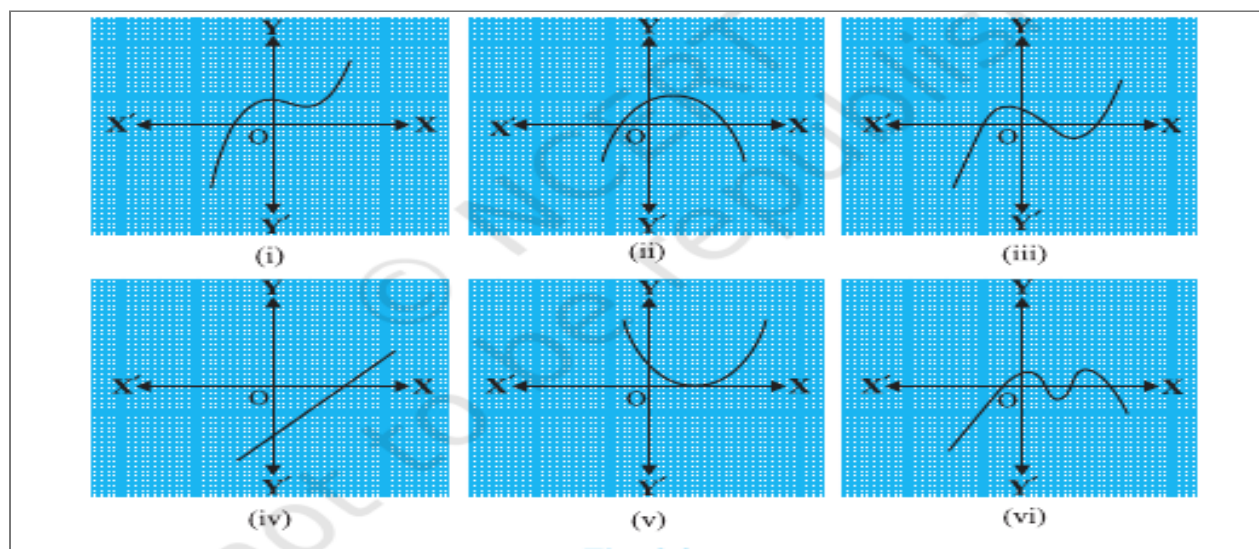


Figure 2.9: six graphs of $y = p(x)$.

Solution

1. The graph intersects the x-axis once, so it has 1 zero.

2. The graph intersects the x-axis twice, so it has 2 zeroes.

3. The graph intersects the x-axis three times, so it has 3 zeroes.

4. The graph intersects the x-axis once, so it has 1 zero.

5. The graph touches the x-axis once, so it has 1 zero.

6. The graph intersects the x-axis four times, so it has 4 zeroes.

Final answer

The numbers of zeroes are 1, 2, 3, 1, 1 and 4 respectively.

NCERT EXAMPLE

Example 2

quadratic polynomials · zeroes and coefficients

Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients.

Solution

$$x^2 + 7x + 10 = (x + 2)(x + 5)$$

Thus the zeroes are -2 and -5 .

$$(-2) + (-5) = -7 = -\frac{b}{a}$$

$$(-2)(-5) = 10 = \frac{c}{a}$$

Final answer

The zeroes are -2 and -5 ; their sum is -7 and product is 10 .

NCERT EXAMPLE

Example 3

quadratic polynomials · zeroes and coefficients

Find the zeroes of the polynomial $x^2 - 3$ and verify the relationship between the zeroes and the coefficients.

Solution

$$x^2 - 3 = (x - \sqrt{3})(x + \sqrt{3})$$

The zeroes are $\sqrt{3}$ and $-\sqrt{3}$.

$$\sqrt{3} - \sqrt{3} = 0 = -\frac{b}{a}$$

$$(\sqrt{3})(-\sqrt{3}) = -3 = \frac{c}{a}$$

Final answer

The zeroes are $\sqrt{3}$ and $-\sqrt{3}$; their sum is 0 and product is -3 .

NCERT EXAMPLE

Example 4

forming a quadratic polynomial · sum and product of zeroes

Find a quadratic polynomial whose zeroes have sum -3 and product 2 .

Solution

$$x^2 - (\alpha + \beta)x + \alpha\beta = x^2 + 3x + 2$$

Every non-zero real multiple of this polynomial has the same zeroes.

Final answer

$$x^2 + 3x + 2$$

NCERT EXAMPLE

Example 5

cubic polynomials · zeroes and coefficients

Verify that 3, -1 and -1/3 are the zeroes of $p(x) = 3x^3 - 5x^2 - 11x - 3$, and verify the relationship between the zeroes and the coefficients.

Solution

$$p(3) = 81 - 45 - 33 - 3 = 0$$

$$p(-1) = -3 - 5 + 11 - 3 = 0$$

$$p\left(-\frac{1}{3}\right) = -\frac{1}{9} - \frac{5}{9} + \frac{11}{3} - 3 = 0$$

$$3 - 1 - \frac{1}{3} = \frac{5}{3} = -\frac{b}{a}$$

$$3(-1) + (-1)\left(-\frac{1}{3}\right) + \left(-\frac{1}{3}\right)3 = -\frac{11}{3} = \frac{c}{a}$$

$$3(-1)\left(-\frac{1}{3}\right) = 1 = -\frac{d}{a}$$

Final answer

All three values are zeroes, and the sum, pairwise-product sum and product agree with the coefficient relationships.