MATHS

NCERT - NCERT MATHEMATICS(ENGLISH)

POLYNOMIALS

Exercise 2 2

1. Find the zeroes of the following quadratic polynomials and verify the relationship

between the zeroes and the coefficients $t^2 - 15$

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2. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients $4u^2 + 8u$

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3. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients

$3x^2 - x - 4$

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4. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients

$x^2 - 2x - 8$

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5. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients $6x^2 - 3 - 7x$

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6. Find the zeroes of the following quadratic polynomials and verify the relationship

between the zeroes and the coefficients $4s^2 - 4s + 1$

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7. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroes and the coefficients. - (i) $x^2 - 2x - 8$ (ii) $4s^2 - 4s + 1$ (iii) $6x^2 - 3 - 7x$ (iv) $4u^2 + 8u$ (v)$t^2 - 15$ (vi) $3x^2 - x - 4$

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8. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively.(iv) 1, 1 (v) $-\frac{1}{4}, \frac{1}{4}$ (vi) 4, 1

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9. Find a quadratic polynomial each with the given numbers as the sum and product of its zeroes respectively.(i) $\frac{1}{4}, -1$ (ii) $\sqrt{2}, \frac{1}{3}$ (iii) $0, \sqrt{5}$(iv) $1, 1$(v) $-\frac{1}{4}, \frac{1}{4}$(vi) $4, 1$

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Solved Examples

1. Divide $3x^3 + x^2 + 2x + 5$by $1 + 2x + x^2$.

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2. Verify that $3,\ 1,\ -\frac{1}{3}$are the zeroes of the cubic polynomial $p(x) = 3x^3 - 5x^2 - 11x - 3$, and then verify

the relationship between the zeroes and the coefficients.

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3. Find a quadratic polynomial, the sum and product of whose zeroes are -3 and 2, respectively.

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

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

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

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7. Find all the zeroes of $2x^4 - 3x^3 - 3x^2 + 6x - 2$, if you know that two of its zeroes are $\sqrt{2}$and $-\sqrt{2}$.

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8. Divide $3x^2 + x^3 - 3x + 5$by $x - 1 - x^2$, and verify the division algorithm.

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9. Divide $2x^2 + 3x + 1$by $x + 2$

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Exercise 2 1

1. The graphs of $y = p(x)$ are given in Figure below, for some polynomials p(x). Find the number of zeroes of p(x), in each case.

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Exercise 2 3

1. Divide the polynomial p(x) by the polynomial g(x) and find the quotient and remainder in

each of the following :

$p(x) = x^3 - 3x^2 + 5x - 3, g(x) = x^2 - 2$

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2. Divide the polynomial p(x) by the polynomial g(x) and find the quotient and remainder in each of the following :

$p(x) = x^4 - 3x^2 + 4x + 5, g(x) = x^2 + 1 - x$

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3. Apply the division algorithm to find the quotient and remainder on dividing $f(x) = x^3 - 3x^2 + 5x - 3$ by $g(x) = x^2 - 2$

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4. On dividing $x^3 - 3x^2 + x + 2$by a polynomial the quotient and remainder were $x - 2$and $-2x + 4$, respectively. Find g(x).

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5. Give an example of polynomials $f(x)$, $g(x)$, $q(x)$ and $r(x)$ satisfying $f(x) = g(x)\dot{q}(x) + r(x)$, where degree $r(x) = 0$.

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6. Obtain all the zeros of the polynomial $f(x) = 3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its zeros are$\sqrt{}and -\sqrt{\frac{5}{3}}$

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7. Check whether the first polynomial is a factor of the second polynomial by dividing the second polynomial by the first polynomial :

$t^2 - 3, 2t^4 + 3t^3 - 2t^2 - 9t - 12$

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8. Check whether the first polynomial is a factor of the second polynomial by dividing the second polynomial by the first polynomial :

$x^3 - 3x + 1, x^5 - 4x^3 + x^2 + 3x + 1$

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9. Check whether the first polynomial is a factor of the second polynomial by dividing the second polynomial by the first polynomial :

$x^2 + 3x + 1, 3x^4 + 5x^3 - 7x^2 + 2x + 2$

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Exercise 2 4

1. If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$is divided by another polynomial $x^2 - 2x + k$, the remainder copies out to be $x + a$. Find k and a.

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2. If two zeroes of the polynomial $x^4 - 6x^3 - 26x^2 + 138x - 35$are $2 \pm \sqrt{3}$, find other zeroes.

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3. If the zeroes of the polynomial $x^3 - 3x^2 + x + 1$are $a - b, a, a + b,$ find a and b.

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4. Find a cubic polynomial with the sum, sum of the product of its zeroes taken two at a time, and the product of its zeroes as $2,\ 7,\ 14$ respectively.

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5. Verify that the numbers given alongside of the cubic polynomials below are their zeroes. Also verify the relationship between the zeroes and the coefficients in each case:(i) $2x^3 + x^2 - 5x + 2; \frac{1}{2}, 1, -2$ (ii) $x^3 - 4x^2 + 5x - 2; 2, 1, 1$

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