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CLASS X

WORK SHEET ON POLYNOMIALS

1. Find the zeros of the following quadratic polynomials and verify the relation between the zeros and the coefficients. (i)  $5x^2 - 4 - 8x$  (ii)  $6x^2 - 7x - 3$  (iii)  $x^2 + 2x + 1$
2. Find the quadratic polynomial where the sum and product of the zeros are given as 3 and -2. Find the zeros of the polynomial.
3. For what value of k, -4 is a zero of the polynomial  $x^2 - x - (2k + 2)$
4. For what value of p, 2 is a zero of the polynomial  $x^2 - 2x - (2p + 8)$ .
5. If the zeros of the polynomial  $3x^2 - px + 2$  and  $4x^2 - qx - 10$  is 2, find the value of  $2p - 3q$ .
6. If  $\alpha$  and  $\beta$  are the zeros of the polynomial  $6x^2 - 7x + 3$  find the values of (i)  $\alpha^2 + \beta^2$   
(ii)  $\frac{1}{\alpha} + \frac{1}{\beta}$  (iii)  $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$
7. If  $\alpha$  and  $\beta$  are the zeros of the polynomial  $2x^2 - 5x + 7$ , find a quadratic polynomial whose zeros are given by  $(2\alpha + 3\beta)$  and  $(3\alpha + 2\beta)$
8. Divide  $2x^4 - 9x^3 + 5x^2 + 3x - 8$  by  $x^2 - 4x + 1$  and verify the division algorithm.
9. On dividing  $x^3 - 2x^2 + x - 2$  by  $g(x)$  the quotient and remainder were  $(x-2)$  and  $(-2x+4)$  respectively. Find  $g(x)$ .
10. On dividing the polynomial  $p(x) = 9x^4 - 4x^2 + 4$  by the polynomial  $g(x) = 3x^2 + x - 1$ , the remainder is  $ax - b$ . Find a and b.
11. Find all the zeros of the polynomial  $2x^4 + 7x^3 - 19x^2 - 14x + 30$  if two of its zeros are  $\sqrt{2}$  and  $-\sqrt{2}$ .
12. Find all the zeros of the polynomial  $x^4 - 6x^3 - 26x^2 - 138x - 35$ , if two of its zeros are  $2 + \sqrt{3}$  and  $2 - \sqrt{3}$ .
13. What must be added to the polynomial  $p(x) = 5x^4 + 6x^3 - 13x^2 - 44x + 7$  so that the resulting polynomial is exactly divisible by  $q(x) = x^2 + 4x + 3$ . (Degree of the polynomial should be less than the degree of  $q(x)$ )
14. If the remainder on division of  $x^3 + 2x^2 + kx + 3$  by  $x - 3$  is 21, find the quotient and the value of k hence find the zeros of the polynomial  $x^3 + 2x^2 + kx - 18$ .
15. If one zero of the polynomial  $7x - x^3 - 6$  is 1, find the other zeros.

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