CLASS IX : ASSIGNMENT : CHAPTER-2 : POLYNOMIALS : MATHEMATICS

1. Classify the following as linear, constant, quadratic, cubic, or bi-quadratic polynomials from the following polynomials:

a) $f(x) = 0$
b) $g(x) = 2x^3 – 7x + 4$
c) $h(x) = -3x + ½$
d) $p(x) = 2x^2 – x + 4$
e) $q(x) = 10x^4 – 7x^3 + 8x^2 - 12x – 20$
f) $r(x) = 3x^3 + 4x^2 + 5x – 7$
g) $s(x) = 3/2$
h) $t(x) = 3x$

2. find the zeroes of the following polynomials:

a) $f(x) = x^2 – 1$
b) $g(x) = 3x^2 – 2$
c) $h(x) = x^2$
d) $p(x) = lx + m$
e) $q(y) = 2y$
f) $r(t) = at$

3. If $x = 4/3$ is the root of the following polynomial $f(x) = 6x^3 – 11x^2 + kx – 20$, find the value of k.
4. If $x = 2$ and $x = 0$ are the roots of the polynomial $f(x) = 2x^3 – 5x^2 + ax + b$. Find the values of a and b.
5. Show that $(x + 1)$ and $(2x - 3)$ are the factors of $2x^3 – 9x^2 + x + 12$.
6. Find the value of a, if $(x- a)$ is a factor of $x^3 – ax^2 + x + 2$.
7. Find the values of a and b so that the polynomial $x^3 – ax^2 – 13x + b$ has $(x – 1)$ and $(x + 3)$ as factors.
8. If $(x^2 – 1)$ is a factor of $ax^4 + bx^3 + cx^2 + dx + e$. show that $(a + c + e) = (b + d) = 0$
9. Prove that $2x^4 – 6x^3 + 3x^2 + 3x – 2$ is exactly divisible by $x^2 – 3x + 2$
   a) Using actual division
   b) Using factor theorem.
10. Expand each of the following:
    a) $(√2x – 3y)^2$
    b) $(x – 1)(x + 1)(x^2 + 1)(x^4 + 1)$
    c) $(x – y/5 -1)(x + y/5 + 1)$
    d) $(-x + 2y + z)^2$
    e) $(a^2 + b^2 + c^2)^2$
    f) $(a/bc + b/ca + c/ab)^2$
    g) $(1/3x – 2/5y)^3$
    h) $(7a – 5b)(49a^2 + 35ab + 25b^2)$
    i) $(x + y + 2z)(x^2 + y^2 + 4z^2 – xy - 2yz - 2zx)$
    j) $(2/x – x/2)(4/x^2 + x^2/4 + 1)$
    k) $(4x + 3y)(16x^2 – 12xy + 9y^2)$
11. Factorize each of the following expressions:
    a) $x^8 – y^8$
    b) $a^{12}x^4 – a^4x^{12}$
    c) $4a^2 – 9b^2 – 2a - 3b$
    d) $1 - 2ab – (a^2 + b^2)$
    e) $x^4 + x^2 + 1$
    f) $x^4 + 4$
    g) $x^2 + 3√3 x + 6$
    h) $4√3 x^2 + 5x - 2√3$
    i) $27 a^3 + 125 b^3$
    j) $p^6 - 512 q^6$
    k) $a^6 – b^6$
    l) $a^6 + b^6$
    m) $a^7 + ab^6$
    n) $x^6 – 7x^3 – 8$
    o) $27 p^3 - 1/216 - 9/2p^2 + 1/4p$
    p) $a^3 + 3a^2b + 3ab^2 + b^3 – 8$
    q) $8x^3 + 27y^3 + z^3 – 18xyz$
    r) $2√2 a^3 + 8b^3 – 27c^3 + 18√2abc$
    s) $y^3 – 7y + 6$
    t) $3x^3 – x^2 – 3x + 1$
    u) $2y^3 + y^2 – 2y – 1$
    v) $x^3 + 2x^2 – x – 2$
12. Give possible expressions for the length and breadth of a rectangle whose area is $25a^2 – 35a + 12$.
13. What are the possible dimensions of a cuboid whose volume is $2ky^2 + 6ky – 20k$?
14. Factorize $x^3 + 13x^2 + 32x + 20$, if it is given that $(x + 2)$ is its factor.
15. Factorize $4x^3 + 20x^2 + 33x + 18$, if it is given that $(2x + 3)$ is a factor.

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