

CLASS IX
MATHEMATICS WORKSHEET
CHAPTER 2: POLYNOMIALS

VERY SHORT ANSWER TYPE QUESTIONS

- Q1. Write an example of an algebraic expression that is not a polynomial.
- Q2. $p(x) = \sqrt{x^3} + 1$ is not a polynomial. Give reason
- Q3. Find the value of polynomial $8x^3 - 6x^2 + 2$ at $x = 1$
- Q4. If $p(x) = 6x^3 + 5x^2 - 3x + 2$ find $p(-1)$
- Q5. Find the zero of the polynomial $p(y) = 2y + 7$
- Q6. Find the remainder when $x^{101} - 1$ is divided by $x - 1$
- Q7. Find whether $x^n + y^n$ is divisible by $x - y$ ($y \neq 0$) or not.
- Q8. Write the following polynomials in standard form
- $4y - 4y^3 + 3 - y^4$
 - $5m^3 - 6m + 7 - 2m^2$
- Q9. Write the integral zeroes of the following polynomials
- $(x - 3)(x - 7)$
 - $(x + 1)(3x + 2)$

SHORT ANSWER TYPE QUESTIONS

- Q10. If $y = -1$ is a zero of the polynomial $q(y) = 4y^3 + ky^2 - y - 1$, then find the value of k
- Q11. For what value of m is $x^3 - 2mx^2 + 16$ divisible by $x + 2$
- Q12. Prove that $(a + b + c)^3 - a^3 - b^3 - c^3 = 3(a + b)(b + c)(c + a)$
- Q13. If $x + 1/x = 5$, find the value of $x^3 + 1/x^3$
- Q14. The polynomials $x^3 + 2x^2 - 5ax - 7$ and $x^3 + ax^2 - 12x + 6$ when divided by $x + 1$ and $x - 2$ respectively, leave remainders R_1 and R_2 respectively. Find the value of a in each of the following cases:
- $R_1 = R_2$
 - $R_1 + R_2 = 0$
 - $2R_1 + R_2 = 0$
- Q15. If $a + b + c = 9$ and $ab + bc + ca = 26$, find $a^2 + b^2 + c^2$
- Q16. If $a + b + c = 0$, prove that :

$$\frac{a^2}{bc} + \frac{b^2}{ab} + \frac{c^2}{ca} = 3$$

- Q17. Find the zeroes of $(x - 2)^2 - (x + 2)^2$

LONG ANSWER TYPE QUESTIONS

- Q18. Factorise $p(x) = x^4 + x^3 - 7x^2 - x + 6$ by factor theorem
- Q19. Prove that $2x^4 - 6x^3 + 3x^2 + 3x - 2$ is exactly divisible by $x^2 - 3x + 2$
- By actual division
 - Without actual division
- Q20. When a polynomial $p(x) = x^4 - 2x^3 + 3x^2 - ax + b$ is divisible by $x - 1$ and $x + 1$, the remainders are 5 and 19 respectively. Find the remainder when $p(x)$ is divided by $x - 2$.

Q21. Simplify:

$$\frac{(4x^2 - 9y^2)^3 + (9y^2 - 16z^2)^3 + (16z^2 - 4x^2)^3}{(2x - 3y)^3 + (3y - 4z)^3 + (4z - 2x)^3}$$

Q22. If $x - 3$ and $x - 1/3$ are both factors of $ax^2 + 5x + b$, show that $a = b$

Q23. Factorize:

- i. $3(x+2)^2 - 5(x+2) + 2$
- ii. $x^6 + y^6$
- iii. $3\sqrt{3}x^3 - 5\sqrt{5}y^3$

ANSWERS:

3. 4

4. 4

5. $y = -7/2$

6. 0

7. no(show why)

8.i). $-y^4 - 4y^3 + 4y + 3$

ii). $5m^3 - 2m^2 - 6m + 7$

9.i). 3, 7 ii). -1

10. 4

11. $m = 1$

13. 110

14. i). $a = -4$ ii). $a = 16/9$ iii). $a = -11/7$

15. 1, -1, 2, -3

17. $a = 5$, $b = 8$

18. 29

19. $(2x + 3y)(3y + 4z)(4z + 2x)$

22. 0

23.i). $(3x + 4)(x + 1)$

ii). $(x^2 + y^2)(x^4 + x^2y^2 + y^4)$

iii). $(\sqrt{3}x - \sqrt{5}y)(3x^2 - \sqrt{15}xy + 5y^2)$

