

SOLUTIONS

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SOLUTIONS: CHAPTER TEST - POLYNOMIALS

Mathematics | Class IX (2026/POLYN/09/001)

Section A (Multiple Choice Questions)

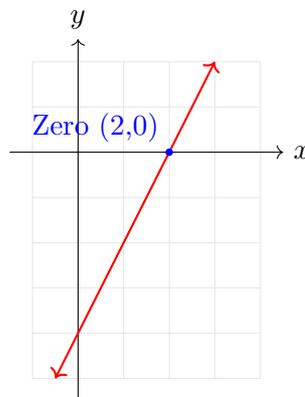
- (b) $\sqrt{3}x^2 + 5x - 1$ is a polynomial in one variable. (a) contains $2/x$ (x^{-1}), (c) contains \sqrt{y} ($y^{1/2}$), and (d) has two variables x, y .
- (a) **0**. The degree of a non-zero constant polynomial (like $p(x) = 5$) is 0.
- (d) **6**. $p(x) = x + 3$. $p(-x) = -x + 3$. Thus, $p(x) + p(-x) = (x + 3) + (-x + 3) = 6$.
- (c) **3**. By definition, a cubic polynomial (degree 3) can have at most 3 zeroes.
- (b) **-6**. $p(-1) = 5(-1) - 4(-1)^2 + 3 = -5 - 4(1) + 3 = -9 + 3 = -6$.
- (b) **(-b/a, 0)**. Setting $ax + b = 0 \implies x = -b/a$. The point on the x-axis is $(-b/a, 0)$.
- (c) $\pi/3$. $3y - \pi = 0 \implies 3y = \pi \implies y = \pi/3$.
- (c) **(a+b)(a-b)**. $(100 + 2) \times (100 - 2) = 100^2 - 2^2$.

Section B (Very Short Answer Questions)

- (i) Quadratic (ii) Linear (iii) Cubic (iv) Quadratic.
- $p(2) = k(2)^2 - 3(2) + k = 0 \implies 4k - 6 + k = 0 \implies 5k = 6 \implies k = 6/5$.
- $(99)^2 = (100 - 1)^2 = 100^2 - 2(100)(1) + 1^2 = 10000 - 200 + 1 = 9801$.
- (i) Coefficient of x^2 in $2 - x^2 + x^3$ is **-1**.
(ii) Coefficient of x^2 in $\frac{\pi}{2}x^2 + x$ is $\pi/2$.

Section C (Short Answer Questions)

- To draw $f(x) = 2x - 4$: At $x = 0, y = -4$; at $x = 2, y = 0$.



The polynomial becomes zero at $x = 2$.

2. $(x + y)^2 = x^2 + y^2 + 2xy$.
 $12^2 = x^2 + y^2 + 2(27) \implies 144 = x^2 + y^2 + 54$.
 $x^2 + y^2 = 144 - 54 = \mathbf{90}$.
3. (i) $p(-1/\sqrt{3}) = 3(-1/\sqrt{3})^2 - 1 = 3(1/3) - 1 = 0$ (Zero).
 $p(2/\sqrt{3}) = 3(2/\sqrt{3})^2 - 1 = 3(4/3) - 1 = 3 \neq 0$ (Not a zero).
(ii) $g(-m/l) = l(-m/l) + m = -m + m = 0$ (Zero).

Section D (Long Answer Questions)

1. (i) $(2x - y + z)^2 = (2x)^2 + (-y)^2 + z^2 + 2(2x)(-y) + 2(-y)(z) + 2(z)(2x)$
 $= \mathbf{4x^2 + y^2 + z^2 - 4xy - 2yz + 4zx}$.
(ii) $(x + 4)(x + 10) = x^2 + (4 + 10)x + 40 = \mathbf{x^2 + 14x + 40}$ [Identity: $(x + a)(x + b)$].
 $(3 - 2x)(3 + 2x) = 3^2 - (2x)^2 = \mathbf{9 - 4x^2}$ [Identity: $(a - b)(a + b)$].
2. (i) $p(1) = a + b + 1 - 6 = 0 \implies a + b = 5$.
 $p(-2) = a(-8) + b(4) - 2 - 6 = 0 \implies -8a + 4b = 8 \implies -2a + b = 2$.
(ii) Subtracting equations: $(a + b) - (-2a + b) = 5 - 2 \implies 3a = 3 \implies \mathbf{a = 1}$.
Substituting $a = 1$ in $a + b = 5 \implies \mathbf{b = 4}$.
(iii) Resulting $p(x) = x^3 + 4x^2 + x - 6$. **Degree = 3, Cubic Polynomial.**

Section E (Case Study Based Question)

1. (b) **3 units.** $H(2) = -(2)^2 + 6(2) - 5 = -4 + 12 - 5 = 3$.
2. (b) **x = -4.** $0.5x + 2 = 0 \implies 0.5x = -2 \implies x = -4$.
3. (b) **Quadratic polynomial.** Degree is 2.
4. (c) **Zeros.** These are the points where the polynomial value is zero.
5. (b) **0.5.** The value multiplied by x is 0.5.