

CLASS - 9Comprehensive Chapter Practice: HOTS & NCERT Questions

Q 1. If $p(x) = x^2 - 2\sqrt{2}x + 1$, then $p(2\sqrt{2})$ is equal to:

- (a) 0 (b) 1 (c) $4\sqrt{2}$ (d) $8\sqrt{2} + 1$

Q 2. One of the zeroes of the polynomial $2x^2 + 7x - 4$ is:

- (a) 2 (b) $\frac{1}{2}$ (c) $-\frac{1}{2}$ (d) -2

Q 3. The roots of the polynomial equation $3x^3 - 12x = 0$ are:

- (a) 3, 2, -2 (b) 3, 0, 4
(c) 0, 2, -2 (d) 3, 0, 2

Q 4. The polynomial $p(x) = x^m + x$, where $m > 1$, when divided by $(x - a)$, leaves remained 6. Given that a is a positive integer, what is the value of m ?

- (a) 2 (b) 3 (c) 5 (d) 6

[HOTS] [TERM by CBSE]

Q 5. If $(x + 2)$ and $(x - 1)$ are factors of the polynomial $10x^2 + px + q$, then p/q is:

- (a) $-\frac{1}{2}$ (b) $\frac{1}{4}$ (c) -1 (d) -2

Q 6. The remainder when $x^3 + 3x^2 + 3x + 1$ is divided by $5 + 2x$ is:

- (a) $-\frac{27}{8}$ (b) $\frac{23}{5}$ (c) $\frac{27}{8}$
(d) $-\frac{27}{11}$

Q 7. The coefficient of x in the expansion of $(x + 3)^3$ is:

- (a) 1 (b) 9 (c) 18 (d) 27

- Q 8. The value of the polynomial $5x - 4x^2 + 3$, when $x = -1$ is:
(a) -6 (b) 6 (c) 2 (d) -2
- Q 9. Which of the following algebraic expression is a polynomial in one variable?
(a) $7x^2 - 2/x$ (b) $7x^2 - 3x + \sqrt{2}$
(c) $(x-2)(x-4)/x$ (d) $7x^2 - xy + 5y + 2$
- Q 10. Zero of the polynomial $p(x)$, where $p(x) = ax + 1$, $a \neq 0$ is:
(a) $-1/a$ (b) 0 (c) $1/a$ (d) $-a$
- Q 11. If $x^3 + y^3 + z^3 = 0$, then
(a) $x^3 + y^3 + z^3 = 0$ (b) $x^3 + y^3 + z^3 - 27xyz$
(c) $(x + y + z)^3 = 27xyz$ (d) $x + y + z = 3xyz$
- Q 12. If $49x^2 - b = (7x + 1/2)(7x - 1/2)$, then the value of b is
(a) 0 (b) $1/\sqrt{2}$ (c) $1/4$ (d) $1/2$
- Q 13. If $a^2 + b^2 + c^2 = 200$ and $ab + bc + ca = 28$, then the value of $a + b + c$ is:
(a) 156 (b) 256 (c) 16 (d) 320
- Q 14. Which of the following is a factor of $(x + y)^3 - (x^3 + y^3)$?
(a) $x^2 + xy + 2xy$ (b) $x^2 + y^2 - xy$
(c) xy^2 (d) $3xy$
- Q 15. If $a + b + c = 0$, then the value of $a^3 + b^3 + c^3$ is:
(a) 0 (b) abc (c) $2abc$ (d) $3abc$

[HOTS]

[HOTS]

[HOTS]

Q 16. If the polynomial $x^3 + 3x^2 + 3x + 1$ is divided by $x - 5$, then the remainder is:

- (a) 1 (b) 216 (c) - 216 (d) 27

[HOTS]

Q 17. If $x + k$ is a factor of the polynomial $x^3 + kx^2 - 2x + k + 5$, then the value of k is:

- (a) $-5/3$ (b) 5 (c) - 5 (d) $5/2$

[HOTS]

Q 18. If $a^2 + b^2 + 2(ab + bc + ca)$ is given expression, then:

- (i) $(a + b)$ is one of the factor.
 (ii) $(a + b + 2c)$ is one of the factor.
 (iii) $(a - b)$ is one of the factor.
 (iv) $(a + b - 2c)$ is one of the factor.

Choose the correct option from the following:

- (a) (i) and (ii) (b) Only (i)
 (c) Only (ii) (d) (iii) and (iv)

[HOTS]

Q 19. If the polynomial $2x^3 - 3x^2 + 5x - 3$ is divided by $x + 2$, then which of the following options hold true:

- (i) Remainder = 10
 (ii) Remainder = 7
 (iii) Quotient = $2x^2 - 4x + 5x - 5$
 (iv) Quotient = $2x^2 + 5x - 5$

Choose the correct option from the following:

- (a) Only (ii) (b) (ii) and (iii)
 (c) (ii) and (iv) (d) Only (iv)

[HOTS]

Q 20. If the polynomial $x^3 - 3x^2 + 4x + 50$ is divided by $x + 3$, then

- (i) Coefficient of x^2 in quotient is 2.
 (ii) Coefficient of x in quotient is - 6.

(iii) Remainder is - 16.

(iv) Remainder is 16.

Choose the correct option from the following:

(a) Only (i)

(b) Only (iv)

(c) (ii) and (iii)

(d) (i) and (iv)

[HOTS]

Q 21. Write the degree of each of the following polynomials:

(i) $-5x^3 + 14x^2 + (7x / 2)$

(ii) $15t - \sqrt{7} / 2$

(iii) 33

(iv) $9x^3 - 19x + 13x$

(v) 100

(vi) $y^3 (1 - y^3)$

[HOTS]

Q 22. Check whether 0 and 2 are zeroes of the polynomial $x^2 - 2x$.

[NCERT]

Q 23. Find the value of the polynomial $4 + x^3 - x + 2x^2$ at:

(i) $x = 0$

(ii) $x = -1$

(iii) $x = 3$

[HOTS]

Q 24. Check whether $p(x)$ is a multiple of $g(x)$ or not:

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

(ii) $p(x) = 2x^3 - 11x^2 - 4x + 5$, $g(x) = 2x + 1$

[NCERT Exemplar]

Q 25. Find the value of k , if $x - 1$ is a factor of $4x^3 + 3x^2 - 4x + k$.

[HOTS]

Q 26. Find the value of m so that $2x - 1$ is a factor of

$8x^4 + 4x^3 - 16x^2 + 10x + m$.

[HOTS]

Q 27. What is the possible expression for the dimensions of the cuboid whose volume is $3x^2 - 12x$?

Q 28. Factorise the following using suitable identity:

(i) $a^2 + 4b^2 + 25c^2 + 4ab + 20bc + 10ac$

(iii) $x^{12} - y^{12}$

Q 29. Find the products using suitable identities:

(i) $(x + 3y + 5z)(x^2 + 9y^2 + 25z^2 - 3xy - 15yz - 5zx)$

(ii) $(-z + x - 2y)(x^2 + 4y^2 + z^2 + 2xy - 2yz + zx)$

[NCERT Exemplar]

Q 30. Simplify:

$$\frac{(a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3}{(a - b)^3 + (b - c)^3 + (c - a)^3}$$

[HOTS]

Q 31. Find the value of $x^3 - 8y^3 - 36xy - 216$, when $x = 2y + 6$.

[HOTS]

Q 32. If $x + y + z = 8$ and $xy + yz + zx = 20$, find the value so

$x^3 + y^3 + z^3 - 3xyz$.

[HOTS]

Q 33. (i) If $a + b = 8$ and $ab = 6$, find the value of $a^3 + b^3$.

(ii) If $a - b = 6$ and $ab = 20$, find the value of $a^3 - b^3$.

[HOTS]

Q 34. Find the roots of the following polynomial equations:

(i) $3x - 10 = 0$

(ii) $2\sqrt{7}x - 11 = 0$

(iii) $(x - 3)(x + 2) = 0$

[HOTS]

Q 35. Simplify:

(i) $(a + b + c)^2 - (a - b + c)^2$

(ii) $(a + b + c)^2 + (a - b + c)^2 + (a + b - c)^2$

(iii) $(2x + p - c)^2 - (2x - p + c)^2$

[HOTS]

Q 36. If $x = 4/3$ is a zero of the polynomial $f(x) = 6x^3 - 11x^2 + kx - 20$, find the value of k .

[HOTS]

Q 37. Factorise each of the following expressions by splitting the middle term:

(i) $9y^2/2 + 4y + 2$

(ii) $y^2/2 + 9/2 y + 10$

(iii) $x^2/2 + 6x + 18$ (iv) $2x^2/3 - 17x/3 - 28$

[HOTS]

Q 38. Verify if 1 and - 3 are zeroes of the polynomial $3x^3 + 5x^2 - 11x + 3$. If yes, then factorise the polynomial.

[HOTS]

Q 39. If $x + 1/x = 4$, find the values of

(i) $x^2 + \frac{1}{x^2}$ (ii) $x^4 + \frac{1}{x^4}$ (iii) $x^3 + \frac{1}{x^3}$

(iv) $x - \frac{1}{x}$

[HOTS]

Q 40. If $x^2 - 1$ is a factor of $p(x) = ax^4 + bx^3 + cx^2 + dx + e$, show that $a + c + e = b + d = 0$.

[HOTS]

Q 41. Factorise each of the following expressions by splitting the middle term:

(i) $x^4 + 19x^2 - 150$

(ii) $x^4 + 3x^2 - 28$

(iii) $x^4 + 4x^2 + 3$

[HOTS]

Q 42. Factorise the cubic polynomial $2x^3 - x^2 - 13x - 6$.

[HOTS]