



DSSSB TGT

PART(A+B)



MATHS

POLYNOMIALS (बहुपद)

Part-02



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Part(A+B)



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$$1. \quad x + \frac{1}{x} \Rightarrow x + x^{-1} \quad \times$$

$$2. \quad \sqrt[3]{y} + y^2 \Rightarrow y^{\frac{1}{3}} + y^2 \quad \times$$

$$3. \quad \sqrt{x+3} \Rightarrow x^{\frac{1}{2}} + 3 \quad \times$$

इनमें [] कोन-सा
एक polynomial
है?

None of these

$$\Rightarrow \overbrace{x^3} + \overbrace{2x^2} + \overbrace{3x} + \overbrace{4}$$

Terms $\rightarrow 4$

Degree $\rightarrow$ maximum power $\Rightarrow 3$

Coefficient of x^2 $\Rightarrow 2$

$$\Rightarrow 4x^2 + 7x^2 + 9x^3 \Rightarrow 11x^2 + 9x^3$$

Terms $\rightarrow 2$

Degree $\rightarrow 3$

Coefficient of $x^2 = 11$

Based on Terms CLASSIFICATION OF Polynomial

1. Monomial → One non-zero term
 $9y^9, 3x^2, 3x, 4y, 5x, 5, 7, 11x^0, x$

2. Binomial → Two non-zero terms
 $ax+b, x^2+2, by+c$

3. Trinomial → Three non-zero terms
 $ax+by+c$

Based of Degree of polynomial

Constant → $3, 5, 7, 11, 1$

Zero → $0 \cdot x, 0 \cdot x^2, 0 \cdot x^3, \dots$
 $a=0$

Linear → $ax+by, \boxed{ax+a}$

Quadratic → $9x^2+5x+3, ax^2+bx+c$

Cubic → $ax^3+bx^2+cx+d+m$

1 The necessary condition for the indices of x in a polynomial of x is.

x के बहुपद में x के सूचकांकों के लिए आवश्यक शर्त है

$x^0 \Rightarrow \textcircled{1}$

(1) whole number

$(0, 1, 2, 3, 4, \dots, \infty)$

(2) integer number

$(-9, -8, -4, -2, 0, 4, 5, 9, \dots)$

~~(3) natural number~~

$\rightarrow (1, 2, 3, 4, \dots, \infty)$

(4) real number

$\rightarrow \left(\frac{p}{q}\right)$

2 Identify the type of polynomial
 $p(z) = 4z^3 + z^2 + 3$ **on the basis of**
the terms.

पदों के आधार पर बहुपद $p(z) = 4z^3 + z^2 + 3$ के प्रकार को पहचानें।

Handwritten diagram showing the polynomial $4z^3 + z^2 + 3$ with three terms underlined. A bracket below the terms points to a circled number 3, indicating there are 3 terms.

(1) Monomial

(2) Binomial

(3) Trinomial

(4) None of the above

3 Identify the type of polynomial
 $p(x) = 2x^2 + x + 1$ **on the basis of**
degree.

घात के आधार पर बहुपद $p(x) = 2x^2 + x + 1$ के प्रकार को पहचानें।

(1) Linear polynomial

(2) Quadratic polynomial

(3) Cubic polynomial

(4) Biquadratic polynomial

$x+y, x+y, y+y$

x^2+2, y^2+9

x^4+11, x^4+3x^3

②

$2x^2 + x + 1$

4 The degree of the polynomial

$p(x) = 0 \cdot x^4 + x^3 + x^2$ is

बहुपद $(x) = 0 \cdot x^4 + x^3 + x^2$ की घात है

(1) 4

(2) 3

(3) 2

(4) 5

$$0 + x^3 + x^2$$

↓
Degree $\rightarrow 3$

$$(x^{10} + 4)(x^{17} + 9) \text{ ki degree} = ?$$

$$x^{27} + 9x^{10} + 4x^{17} + 36$$

$$\text{Degree} = 27$$

5 The degree of the expression

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

व्यंजक की डिग्री $(x^3 + 2x)(x + 4x^2)$ है

(1) 5

(2) 4

(3) 3

(4) 2

$4x^5$

$(x^{10} + x^9 + x^4)(x + x^9 + x^{18})$ की degree

$$10 + 18 = 28$$

6 The coefficient of x in the expansion of $(x + 4)^3$ is

$(x+4)^3$ के विस्तार में x का गुणांक है

(1) 47

(2) 48

(3) 46

(4) 45

$$(a+b)^3 \Rightarrow a^3 + b^3 + 3ab(a+b)$$

$$(x+4)^3 = x^3 + 64 + 3 \times x \times 4 (x+4)$$

$$\Rightarrow \frac{x^3 + 64 + 12x(x+4)}{x} = 12x^2 + 48x$$

Remainder thm

Divisor Dividend

$$\begin{array}{r} p(x) \overline{) q(x)} \quad \text{---} \textcircled{Q} \\ \underline{r(x)} \\ \textcircled{R} \end{array}$$

$$q(x) = p(x) \times q(x) + r(x)$$

भाज्य (Dividend) → भागफल (Quotient)

भाजक (Divisor) ← $5 \overline{) 18} (3$

शेषफल (Remainder) → $\underline{15}$
3

$$\text{Dividend} = \text{divisor} \times \text{Quotient} + \text{Rem}$$

$$\text{भाज्य} = \text{भाजक} \times \text{भागफल} + \text{शेषफल}$$

$$18 = 5 \times 3 + 3$$

$$= 18$$

$$p(x) \overline{) q(x) \overline{) r(x)}}$$

$$r(x) \rightarrow \text{यदि } r(x) = 0$$

$p(x)$ और $q(x)$ ये दोनों $q(x)$ के factor होंगे।

$$\begin{array}{r} 9 \overline{) 45} \\ \underline{45} \\ 0 \end{array}$$

9, 5 दोनों 45 के factor हैं।

x is the factor of
 $x^3 + 4x^2 + 5x$.

$$(R=0)$$

$$\Rightarrow (x^3 + 4x^2 + 5x) \div x$$

$$\Rightarrow \frac{x^3 + 4x^2 + 5x}{x}$$

$$\Rightarrow \frac{x^3}{x} + \frac{4x^2}{x} + \frac{5x}{x}$$

$$\Rightarrow (x^2 + 4x + 5)$$

$$36 - 48 + 12 = 0$$

→ $x^2 + 8x + 12$, का एक factor $(x+6)$ है।
 $4 - 16 + 12 = 0$

$$\begin{aligned} x+2 &= 0 & x+6 &= 0 \\ x &= -2 & x &= -6 \end{aligned}$$

$$(x+6) \overline{) x^2 + 8x + 12} (x+2)$$

$$\frac{x^2}{x} = x$$

$$+ \frac{2x}{x} = 2$$

$(x+6), (x+2)$ ये दोनों

$x^2 + 8x + 12$ के factors
 होंगे।

$$\begin{aligned} &+ 2x + 12 \\ &\underline{- 2x + 12} \\ &0 \end{aligned}$$

7 The number of terms in the expression $(2x + 4)^2(x + 2)$ is
व्यंजक $(2x + 4)^2(x + 2)$ में पदों की संख्या है

- (1) 3
- (2) 4
- (3) 2
- (4) 1

8 Identify the polynomial in the given expression.

दिए गए व्यंजक में बहुपद को पहचानिए।

(1) $5x^{3/2} + 2y + 1$

(2) $5x^5 + 2y + \frac{1}{y}$

(3) $\sqrt{z^3} + 3z + 1$

(4) $\frac{x^4 + 3x^3 + x}{x}$

9 Identify the polynomial, whose coefficient of x^2 is 2 .

उस बहुपद को पहचानें, जिसका गुणांक x^2 2 है।

(1) $(5x + 3)(8x - 4)$

(2) $(3x^2 - 3)(2x - 3)$

(3) $(x - 2)(2x - 8)$

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

10 Identify which of the following polynomial has $(x + 1)$ as a factor?

पहचानें कि निम्नलिखित में से किस बहुपद में $(x+1)$ एक गुणनखंड है?

(1) $x^3 + x^2 + x + 1$

(2) $x^4 + x^3 + x^2 + x + 1$

(3) $x^4 + 3x^3 + 3x^2 + x + 1$

(4) $x^3 - x^2 - (2 + \sqrt{2})x + \sqrt{2}$

11 The value of k , if $(x - 1)$ is a factor of $p(x) = x^2 + x + h$, is

**K का मान, यदि $(x-1)$ $p(x) = x^2 + x +$
 K का एक गुणनखंड है, है**

(1) $k = 2$

(2) $k = -2$

(3) $k = 3$

(4) $k = -3$

$$x-1=0$$

$$\boxed{x=1}$$

$$x^2 + x + k = 0$$

$$1 + 1 + k = 0$$

$$\boxed{k = -2}$$

12 If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2 , then the value of k is

यदि द्विघात बहुपद $x^2 + 3x + k$ का एक शून्यक 2 है, तो k का मान है

- (1) 10
- (2) -10
- (3) -11
- (4) 12

$$x=2$$

13 If one of the zeroes of the quadratic polynomial $(a - 1)x^2 + ax + 1$ is -3 , then find the value of a is.

यदि द्विघात बहुपद $(a - 1)x^2 + ax + 1$ का एक शून्यक -3 है, तो a का मान ज्ञात कीजिए।

- (1) $-4/3$
- (2) $8/3$
- (3) $4/3$
- (4) None of these

14 Factors of the polynomial $x^6 - y^6$ are

बहुपद $x^6 - y^6$ के गुणनखंड हैं

(1) $(x - y)(x^2 + y^2 + xy)(x + y)$
 $(x^2 + y^2 - xy)$

(2) $(x - y)(x^2 + y^2 + xy)(x + y)$
 $(x^2 - y^2 + xy)$

(3) $(x - y)(x + y)(x^2 + y^2 + xy)$
 $(-x^2 + y^2 - xy)$

(4) None of the above

15. If zeroes α and β of a polynomial $x^2 - 7x + k$ are such that $\alpha - \beta = 1$, then the value of k is

यदि एक बहुपद $x^2 - 7x + k$ के शून्यक α और β ऐसे हैं कि $\alpha - \beta = 1$, तो k का मान है

- (1) 12
- (2) -12
- (3) 11
- (4) -11

16. If α and β are the zeroes of the polynomial $2y^2 + 7y + 5$, then the value of $\alpha + \beta + \alpha\beta$ is]

यदि α और β बहुपद $2y^2 + 7y + 5$ के शून्यक हैं, तो $\alpha + \beta + \alpha\beta$ का मान है

(1) 1

(2) 2

(3) -1

(4) 2

17. Find the zeroes of the polynomial $f(x) = x^3 - 5x^2 - 2x + 24$, if it is given that the product of its two zeroes is 12.

बहुपद $f(x) = x^3 - 5x^2 - 2x + 24$ के शून्यक ज्ञात कीजिए, यदि यह दिया गया है कि इसके दो शून्यकों का गुणनफल 12 है।

(1) 3, 4, 2

(2) 3, 4, -2

(3) 3, -4, 2

(4) -3, 4, 2

18. What must be added to $f(x) = 4x^4 + 2x^3 - 2x^2 + x - 1$, so that the resulting polynomial is divisible by $g(x) = x^2 + 2x - 3$?

$f(x) = 4x^4 + 2x^3 - 2x^2 + x - 1$ में क्या जोड़ा जाना चाहिए, ताकि परिणामी बहुपद $g(x) = x^2 + 2x - 3$ से विभाज्य हो?

(1) $61x + 65$

(2) $61x - 65$

(3) $60x - 65$

(4) None of the above

19. If $x^4 + 4x^2 + 3x$ is divided by $x + 2$, then remainder is

यदि $x^4 + 4x^2 + 3x$ को $x+2$ से विभाजित किया जाए तो शेषफल प्राप्त होता है

(1) -26

(2) 12

(3) -12

(4) 26

Remainder is

यदि $p(x) = x^3 - 6x^2 + 2x - 4$ को
 $g(x) = 1 - \frac{3}{2}x$ से विभाजित किया जाए,
तो शेषफल है

$$p\left(\frac{2}{3}\right) = \left(\frac{2}{3}\right)^3 - 6\left(\frac{2}{3}\right)^2 + 2\left(\frac{2}{3}\right) - 4$$

$$\Rightarrow \frac{8}{27} - \frac{24}{9 \times 3} + \frac{4}{3 \times 3} - \frac{4 \times 27}{1 \times 27}$$

$$\frac{8 - 72 + 36 - 108}{27} \Rightarrow \frac{8 - 144}{27} \Rightarrow -\frac{136}{27}$$

(1) $\frac{150}{29}$

(2) $\frac{136}{27}$

(3) $-\frac{136}{27}$

(4) None of these

$$\begin{aligned} 1 - \frac{3}{2}x &= 0 \\ 1 &= \frac{3}{2}x \\ x &= \frac{2}{3} \end{aligned}$$

$$x+4=0$$

$$\boxed{x=-4}$$

$$p(x)=4x^2+6x+5$$

$$p(-4)=4 \times 16 - 24 + 5$$

$$64 - 24$$

$$\Rightarrow 40$$

$$R=?$$

$$\begin{array}{r} \overline{4x^2+6x+5} \quad (4x-10) \\ \underline{4x^2+16x} \\ -10x+5 \\ \underline{+10x-40} \\ +45 \end{array}$$

शेषफल

↑

$$\frac{4x^2}{x} \Rightarrow 4x$$

$$\frac{-10x}{x} = -10$$

21 The zeroes of the quadratic $\frac{1}{5}$ polynomial $y^2 + 92y + 1920$ are

द्विघात $\frac{1}{5}$ बहुपद $y^2 + 92y + 1920$ के शून्यक हैं

- (1) $-31, 60$
- (2) $32, 60$
- (3) $-32, -60$
- (4) $32, -60$

22 Factorise form of polynomial

$p(x) = 12x^2 - 7x + 1$ is

बहुपद $(x) = 12x^2 - 7x + 1$ का
गुणनखंड रूप है

(1) $(4x + 1)(3x - 1)$

(2) $(4x - 1)(3x - 1)$

(3) $(4x + 1)(3x + 1)$

(4) $(4x - 1)(2x - 1)$

23 The simplified form of

$$\left(y^2 + \frac{3}{2}\right) \left(y^2 - \frac{3}{2}\right) \text{ is}$$

$\left(y^2 + \frac{3}{2}\right) \left(y^2 - \frac{3}{2}\right)$ का सरलीकृत रूप है

(1) $y^4 - \frac{9}{2}$

(2) $y^4 + \frac{9}{4}$

(3) $y^4 - \frac{9}{4}$

(4) None of the above

24 The standard form of polynomial $9x^2 + 6xy + y^2$ is

बहुपद का मानक रूप $9x^2 + 6xy + y^2$ है

(1) $(3x + 2y)^2$

(2) $(3x - y)^2$

(3) $(3x + y)^2$

(4) None of the above

25 The degree of the remainder when a cubic polynomial is divided by a quadratic polynomial is

जब एक घन बहुपद को द्विघात बहुपद से विभाजित किया जाता है तो शेषफल की डिग्री होती है

(1) ≤ 1

(2) ≥ 1

(3) 2

(4) ≥ 2

26 Factors of the polynomial $4y^4 + 12y^2z + 9z^2$ are

बहुपद $4y^4 + 12y^2z + 9z^2$ के गुणनखंड हैं

(1) $(2y^2 + 3z)^2$

(2) $(2y^2 - 3z)^2$

(3) $(2y^2 + z)^2$

(4) None of the above

27 On factorising $x^4 - 3x^2 + 2$ we get

$x^4 - 3x^2 + 2$ का गुणनखंड करने पर हमें प्राप्त होता है

(1) $(x + \sqrt{2})(x - \sqrt{2})(x - 1)(x + 1)$

(2) $(x + \sqrt{2})^2(x + 1)^2$

(3) $(x - \sqrt{2})^2(x + 1)^2$

(4) None of the above

28 The zeroes of the quadratic polynomial $4s^2 - 4s + 1$ is

द्विघात बहुपद $s^2 - 4s + 1$ का शून्यक है

- (1) $\frac{1}{2}, \frac{1}{4}$
- (2) $\frac{1}{2}, \frac{1}{2}$
- (3) $\frac{1}{2}, -\frac{1}{2}$
- (4) $\frac{1}{3}, \frac{1}{4}$

29 The sum and product respectively of zeroes of the polynomial $x^2 - 4x + 3$ are

बहुपद $x^2 - 4x + 3$ के शून्यकों का क्रमशः योग और गुणनफल है

(1) 3, 3

(2) 4, 3

(3) -4, 3

(4) $\frac{4}{3}$, 1

$$p(-2) = 0$$

$$p(-2) = 2(-2)^3 - K(-2)^2 + 5(-2) + 9 = 0$$

$$-16 - 4K - 10 + 9 = 0$$

$$-4K - 17 = 0$$

$$-4K = 17$$

$$K = \frac{-17}{4}$$

30 For what value of K is the polynomial $p(x) = 2x^3 - Kx^2 + 5x + 9$ exactly divisible by $(x + 2)$.

K के किस मान के लिए बहुपद

polynomial $p(x) = 2x^3 - Kx^2 + 5x + 9$ बिल्कुल $(x+2)$ से विभाज्य है।

(1) $\frac{-17}{4}$

(2) $\frac{17}{4}$

(3) $\frac{-15}{4}$

(4) $\frac{-4}{17}$

$$x + 2 = 0$$

$$x = -2$$

31. If zeroes of the polynomial $x^2 + (a + 1)x + b$ are 2 and -3 then the value of $(a + b)$ is

(1) 6

(2) -6

(3) -7

(4) 7

32. Find the zeroes of the polynomial $p(x) = (x - 2)^2 - (x + 2)^2$.

(1) 0

(2) 1

(3) 2

(4) None of these

33. If α and β are the zeroes of the quadratic polynomial $p(x) = ax^2 + bx + c$, then evaluate $\alpha^2\beta + \alpha\beta^2$

(1) $\frac{bc}{a^2}$

(2) $-\frac{bc}{a^2}$

(3) $\frac{bc}{a}$

(4) None of the above

34. If the zeroes of the polynomial $ax^2 + bx + b = 0$ are in the ratio $m:n$, then find the value of $\sqrt{\frac{m}{n}} +$

$$\sqrt{\frac{n}{m}}.$$

(1) $\sqrt{ab}$

(2) $\sqrt{\frac{b}{a}}$

(3) $\sqrt{\frac{1}{ab}}$

(4) $\sqrt{\frac{a}{b}}$

35. If the square of difference of the zeroes of the quadratic polynomial $x^2 + ax + 45$ is equal to 144 , then find the value of a .

(1) ± 18

(2) ± 9

(3) ± 14

(4) ± 17

36. $x^3 + 8x^2 + kx + 18$ is completely divisible by $x^2 + 6x + 9$ then find the value of k .

(1) 21

(2) - 21

(3) 22

(4) -22

37. If the polynomials $(2x^3 + kx^2 + 3x - 5)$ and $(x^3 + x^2 - 2x + 2k)$ leave the same remainder, when divided by $(x - 3)$ then find the value of k .

(1) -4

(2) 4

(3) 3

(4) -2

38. Find all other zeroes of the polynomial $x^4 - 2x^3 - 7x^2 + 8x + 12$ if two of its zeroes are -1 and 2.

(1) - 2, - 3

(2) - 2, 3

(3) 2,3

(4) 2,-3

39. If the polynomial $x^4 - 6x^3 + 16x^2 - 25x + 10$ is divided by another polynomial $x^2 - 2x + k$ the remainder comes out to be $x + a$ then find k .

(1) 5

(2) -5

(3) 3

(4) -3

40. The polynomial $3x^3 + ax^2 + 3x + 5$ and $4x^3 + x^2 - 2x + a$ leave remainder R_1 and R_2 , when divided by $(x - 2)$ respectively. If $R_1 - R_2 = 9$, find the value of a .

(1) 3

(2) 2

(3) - 3

(4) 4

41. If $(x^3 + ax^2 + bx + 6)$ has $(x - 2)$ as a factor and leaves a remainder of 3 when divided by $(x - 3)$ then the values of a and b are

(1) 3, -1

(2) -3, -1

(3) = 3

(4) 3, 3

42. Let A and B be the remainders, when the polynomials $y^3 + 2y^2 - 5ay - 7$ and $y^3 + ay^2 - 12y + 6$ are divided by $(y + 1)$ and $(y - 2)$ respectively. If $2A + B = 6$ then find the value of a .

(1) -2

(2) 2

(3) 3

(4) 4