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FOUNDATION⁺ (V₂)
Class: VII, MATHEMATICS

2. ADDITION AND SUBTRACTION OF POLYNOMIALS

TEACHING TASK (JEE MAINS)

01. $4 - 3x$

Ans. B

02. $1 - (x - 2y + 3) = 1 - x + 2y - 3 = -x + 2y - 2$ Ans. C

03. option Verification technique: option A

$$\left(\frac{1}{2}x^3 - \frac{1}{3}x^2 + \frac{3}{4}x - \frac{2}{5}\right) + \left(\frac{1}{2}x^3 + \frac{1}{3}x^2 + \frac{1}{4}x + \frac{2}{5}\right)$$
$$= \left(\frac{1}{2} + \frac{1}{2}\right)x^3 + \left(-\frac{1}{3} + \frac{1}{3}\right)x^2 + \left(\frac{3}{4} + \frac{1}{4}\right)x + \left(-\frac{2}{5} + \frac{2}{5}\right)$$
$$= x^3 + x$$

Ans. A

04. $\left(-\frac{1}{4}x^4 + \frac{1}{2}x^2 - \frac{1}{3}\right) - \left(\frac{1}{4}x^4 - \frac{1}{2}x^2 + \frac{1}{3}\right)$

$$= -\frac{1}{4}x^4 + \frac{1}{2}x^2 - \frac{1}{3} - \frac{1}{4}x^4 + \frac{1}{2}x^2 - \frac{1}{3}$$
$$= -\frac{1}{2}x^4 + x^2 - \frac{2}{3}$$

Ans. A

05. A) $p(x) + q(x) = \left(\frac{5}{6}x - \frac{1}{3}\right) + \left(-\frac{5}{6}x + \frac{1}{3}\right) = 0$ Ans. A

06. $(-x + 2y + 3z) + (3x - y + 2z) + (2x + 3y - z)$

$$= 4x + 4y + 4z$$

Ans. A

07. $5ax - 7by + cz + ax + 2by - cz - 3ax + 2by + 3cz$

$$= 3ax - 3by + 3cz$$

Ans. D

08 $\underline{5x^2 + 7y - 6z^2 + 4y} + \underline{3x^2 + 9x^2 + 2z^2 - 9y} + \underline{2y - 2x^2}$
 $= 15x^2 + 4y - 4z^2$ Ans. A

09 $\left(\frac{1}{2}x^2 + \frac{1}{3}x\right) + Q(x) = x^2 + \frac{1}{2}x - \frac{1}{3}$
 $\Rightarrow Q(x) = x^2 + \frac{1}{2}x - \frac{1}{3} - \frac{1}{2}x^2 - \frac{1}{3}x$
 $= \frac{1}{2}x^2 + \frac{1}{6}x - \frac{1}{3}$ Ans. A

10 $(5x + 2y - z) - (2x - 4y - 3z)$
 $= 5x + 2y - z - 2x + 4y + 3z$
 $= 3x + 6y + 2z$ Ans. B

11. $(y^3 - 3xy^2 - 4x^2y) - (x^3 + 2x^2 + 6xy^2 - y^3)$
 $= y^3 - 3xy^2 - 4x^2y - x^3 - 2x^2 - 6xy^2 + y^3$
 $= 2y^3 - 9xy^2 - 4x^2y - 2x^2 - x^3$ Ans. D

12 $\left(\frac{2}{3}x^2 - \frac{1}{4}x + \frac{1}{2}\right) - \left(\frac{2}{3}x^2 - \frac{1}{4}x + \frac{1}{2}\right)$
 $= \frac{2}{3}x^2 - \frac{1}{4}x + \frac{1}{2} - \frac{2}{3}x^2 + \frac{1}{4}x - \frac{1}{2}$
 $= 0$ Ans. A

13 $(A-C) - (B-D)$
 $= \left[\left(x^2 - x\right) - \left(x^3 + x^2 + x\right)\right] - \left[\left(\frac{x^3}{3} - \frac{x}{2}\right) - \left(x^3 + x\right)\right]$
 $= x^2 - x - x^3 - x^2 - x - \frac{x^3}{3} + \frac{x}{2} + x^3 + x$
 $= -\frac{1}{3}x^3 - \frac{1}{2}x$ Ans. D

14. Let the No. of students in Sect C be C (3)

$$\therefore (x+2y-3z) + (2x-3y+z) + C = 5x-8y+3z$$

$$\Rightarrow (3x-y-2z) + C = 5x-8y+3z$$

$$= C = 5x-8y+3z - 3x + y + 2z$$

$$\Rightarrow C = 2x-7y+5z$$

Ans: C

15

$$(-2a^4+3a^3+a^2+2) - (a^4-3a^3-a^2-1)$$

$$= -2a^4+3a^3+a^2+2 - a^4+3a^3+a^2+1$$

$$= -3a^4+6a^3+2a^2+3$$

Ans: B

16

$$x^3 + \frac{1}{2}x - \frac{1}{3} + x^3 - \frac{1}{2}x + \frac{1}{3}$$

$$= 2x^3$$

Ans: A

17

$$\begin{array}{l|l} 0+2b-3c=5 \rightarrow \textcircled{1} & \textcircled{2}-\textcircled{1} \\ 4a-b+2c=8 \rightarrow \textcircled{2} & \Rightarrow 3a-3b+5c=8-5 \\ \hline 5a+b-c=13 & =3 \end{array}$$

Ans: B

18

$$\frac{2x^2-3xy+5x}{x} = 2x-3y+5$$

Ans: A

JEE ADVANCED LEVEL

19.

$$2x-y+3xy+2x+2xy+3y+xy$$

$$= 4x+2y+6xy = 2(2x+y+3xy)$$

Ans: A, B

20.

$$6a+2b-3c-4a+4b-9c-12$$

$$= 2a+6b-12c-12$$

$$= 2(a+3b-6c-6)$$

Ans: B, C

21. Statement I: Mathematically (True) (4)
Statement II: Conceptually (True) Ans.. A

22. Statement I: $2x^4 + 5x^3 + 6x^4 - 7x^3 + 5$
 $= 8x^4 - 2x^3 + 5$ (True)
Statement II:
 $2x^4 + 5x^3 + 6x^4 - 7x^3 + 5 = 8x^4 - 2x^3 + 5$ (True) Ans.. A

23. Assertion: Conceptual (True)
Reason: Conceptual (True) Ans.. A

24. Assertion: Conceptual (True)
Reason: Conceptual (True) Ans.. A

25. Assertion: Conceptual (True)
Reason: Conceptual (True) Ans.. A

26. Assertion: Conceptual (True)
Reason: Conceptual (True) Ans.. A

27. $B + C = -2x^3 + 4x^2y - 3xy^2 + 6y^3 + 5x^3 + 3x^2y - 2xy^2 + y^3$
 $= 3x^3 + 7x^2y - 5xy^2 + 7y^3$ Ans: C

28. $A - D = 3x^3 - 2x^2y + 5xy^2 - 4y^3 + 4x^3 - 6x^2y + xy^2 + 2y^3$
 $= 7x^3 - 8x^2y + 6xy^2 - 2y^3$ Ans: A

29. $2A - 3B + C = 2(3x^3 - 2x^2y + 5xy^2 - 4y^3) - 3(-2x^3 + 4x^2y - 3xy^2 + 6y^3) + (5x^3 + 3x^2y - 2xy^2 + y^3)$
 $= 6x^3 - 4x^2y + 10xy^2 - 8y^3 + 6x^3 - 12x^2y + 9xy^2 - 18y^3 + 5x^3 + 3x^2y - 2xy^2 + y^3 = 17x^3 - 13x^2y + 17xy^2 - 25y^3$ Ans D

30 $A + D = 3x^3 - 2x^2y + 5xy^2 - 4y^3 + 4x^3 + 6x^2y - xy^2 - 2y^3$ (5)
 $= -x^3 + 4x^2y + 4xy^2 - 6y^3$ Ans: A

31. $C - B = 5x^3 + 3x^2y - 2xy^2 + y^3 + 2x^3 - 4x^2y + 3xy^2 - 6y^3$
 $= 7x^3 - x^2y + xy^2 - 5y^3$ Ans: D

32 $(4x^3 + y^3) - (x^3 + 3y^3)$
 $= 4x^3 + y^3 - x^3 - 3y^3 = 3x^3 - 2y^3$ Ans: A

33. $4x^3 + y^3 + x^3 + 2y^3$ | 34) 0 Ans: 0
 $= 5x^3 + 4y^3$ Ans: B | 35) Coeff. of $x = 2$ Ans: 2

36 a) $1 - x + x^2 - 2x^3 + A = x^3$
 $\Rightarrow A = x^3 - 1 + x - x^2 + 2x^3 = 3x^3 - x^2 + x - 1$ (x)
 b) $50a^2b - 6b^2a - 5b - 22ab + 30a^2b - 2b$
 $= 80a^2b - 6b^2a - 7b - 22ab$ (p)
 c) $2a + b + 5c - 5a - 2b + 3c$
 $= -3a - b + 8c$ (q)
 d) Perimeter = $2(y^3 + 3 + y + 3) = 2y^3 + 2y + 12$ (s)
 Ans: x, p, q, s

37 a) $5a^2 + 7b + 3 - 3a^2 + 5b + 3 = 2a^2 + 12b + 6$ (s)

b) $63a - 63b - 63b + 63a = 126a - 126b$ (x)

c) $\frac{10}{3}x^3$ (p)

d) $3x^2 - 2x - x - 7 + 2x^2 - 3x + 2$
 $= 5x^2 - 6x - 5$ (q) Ans: s, x, p, q

LEARNERS TASK (CUQ'S)

6

01. $p(x) = q(x)$ Am: A
02. $3x^2 + 4x - 3x^2 + 0x^2 = 4x$ Am: A
03. $R(x) = Q(x) - P(x)$ Am: B
04. $7x^2y$ Am: A
05. Conceptual Am: C
06. $5x^3 + 5x^2 + 2x + 22$ Am: B
07. $P(x) = -Q(x)$
08. $(y^2 - x^2) - (x^2 - y^2) = y^2 - x^2 - x^2 + y^2$
 $= 2(y^2 - x^2)$
 $= -2(x^2 - y^2)$ Am: A
09. $p + p - q + q + q - p = p + q$ Am: A
10. 0 Am: B

JEE MAINS LEVEL

01. a) $x^3 + 1 \Rightarrow x^3 - 1$
 Since $(x^3 + 1) + (x^3 - 1) = 2x^3 \neq 0$ Am: C
02. $3x^2 + 2y - 5x^2 + 3y - 4x$
 $= -2x^2 + 5y - 4x$ Am: C
03. $2a - 3b + 5c + 4a + 2b - 7c$
 $= 6a - b - 2c$ Am: A

04. $\frac{3}{2}x^3 + \frac{1}{3}x^2 - \frac{2}{5}x + 1 - \frac{1}{2}x^3 + \frac{2}{3}x^2 + \frac{3}{5}x - 1$ ①
 $= x^3 + x^2 + \frac{1}{5}x$ Ans: A

05. $(7a + 5b) - (4a - 2b) = 7a + 5b - 4a + 2b$
 $= 3a + 7b$ Ans: A

06. $x^2 - xy + y^2 + x^2 + xy + y^2 = 2x^2 + 2y^2$ Ans: B

07. milk left = $(m^4 + 8m^2n^2 + n^4) - (m^4 - 4m^2n^2)$
 $= m^4 + 8m^2n^2 + n^4 - m^4 + 4m^2n^2$
 $= 12m^2n^2 + n^4$ Ans: A

08. $x^2 + x + 1 + x^2 - x + 1 + x^2 + x - 1$
 $= 3x^2 + x + 1$ Ans: C

10. $(5x^2 - 7x + 2) + A = 7x^2 - 1$
 $\Rightarrow A = 7x^2 - 1 - 5x^2 + 7x - 2$
 $\Rightarrow A = 2x^2 + 7x - 3$ Ans: C

09. $(c - 4b) - [(5a - 3b + c) + (3b - 9a)]$
 $= (c - 4b) - [-4a + c]$
 $= c - 4b + 4a - c = 4a - 4b$ Ans: A

11. Perimeter = $2[3a - b + 6b - a]$
 $= 2[2a + 5b] = 4a + 10b$ Ans: B

12. Perimeter = $2y + 3z + z - y + 4y - 2z$
 $= 5y + 2z$ Ans: A

13. $\frac{5}{6}x^3 - \frac{1}{2}x^2 + \frac{2}{3} - \frac{1}{6}x^3 + \frac{1}{2}x - \frac{1}{3}$
 $= \frac{2}{3}x^3 + \frac{1}{3}$ Ans: A

$$14. (5y^3z + 2y^2z^2 - 3z^3 - 5) + A = 6y^3z + z^3 - 4y^2z^2 \quad \textcircled{2}$$

$$\Rightarrow A = 6y^3z + z^3 - 4y^2z^2 - 5y^3z - 2y^2z^2 + 3z^3 + 5$$

$$= y^3z + 4z^3 - 6y^2z^2 + 5 \quad \text{Ans: C}$$

$$15. (2x^3 - 5x^2 - 11x + 2) - (5x^3 - 3x^2 - 8)$$

$$= 2x^3 - 5x^2 - 11x + 2 - 5x^3 + 3x^2 + 8$$

$$= -3x^3 - 2x^2 - 11x + 10 \quad \text{Ans: A}$$

$$16. 3K - (-3K) = 3K + 3K = 6K = 2(3K) \quad \text{Ans: A, B}$$

17. A) Additive inverse of $-3x^2 + 2x - 5$ is $3x^2 - 2x + 5$ (~~True~~) (True)

B) Conceptual (True)

C) Conceptual (True)

D) $-3 + 2 - 5 = -6$ (False) Ans: A, B, C

18. Statement I: $2a - 2b + 3c + a + 2b - 3c = 3a$ (True)

Statement II: Mathematically (True) Ans: A

19. Statement I: Conceptual (True)

Statement II: Conceptual (True) Ans: A

20. Assertion: Conceptual (True)

Reason: Conceptual (True) Ans: A

21. Assertion: Conceptual (True)

Reason: Conceptual (True) Ans: A

22. Assertion: Conceptual (True)

Reason: Conceptual (True) Ans: A

23. $3x + 2y - 8 + 4x - 2y + 7 = 7x + 2$ Ans: B

24. $(4x - 2y + 7) - (2x + 3y - 8) = 4x - 2y + 7 - 2x - 3y + 8$

$$= 2x - 5y + 15 \quad \text{Ans: B}$$

25 $A+B-C$
 $x^2+y^2-2xy+3x^2-4xy+7y^2-3x^2+4y^2$
 $= x^2+12y^2-6xy$ Ans: A

26 $A-B+C$
 $x^2+y^2-2xy-3x^2+4xy-7y^2+3x^2-4y^2$
 $= x^2-10y^2+2xy$ Ans: —

27. $(4x^4-3x^3+x^2+2)-A=4x^4-3x^3+x^2$
 $\Rightarrow A=4x^4-3x^3+x^2+2-4x^4+3x^3-x^2$
 $A=2$ Ans: 2

28 Constant term = 0 Ans: 0

29 a) $x^3-5x^2+7x+2+15x^2+10x-7=x^3+10x^2+17x-5$
 b) $a^3+b^3-3a^2b+7ab^2-4a^3+3a^2b-ab^2+b^3$ (S)
 $= -3a^3+2b^3+6ab^2$ (S)
 c) $15xy+2xy+4x^2-4y^2=4x^2+17xy-4y^2$ (P)
 d) $a^3-3a^2+5a+1-5a^3+2a^2-7=-4a^3-a^2+5a-6$ (Q)
 Ans: S, P, Q

30 a) $P(x)+Q(x)=\frac{2}{5}x^2$ (P)
 b) $P(x)+Q(x)=\frac{6}{3}x$ (Q)
 c) $P(x)+Q(x)=x^3-\frac{1}{2}x+\frac{1}{3}$ (S)
 d) $P(x)+Q(x)=x^2$ (S) Ans: P, Q, S

$\Rightarrow$ THE END $\Leftarrow$