FOUNDATION

Class: VI, MATHEMATICS

5. ADDITION AND SUBSTRACTION OF ALGEBRAIC EXPRESSIONS

Teaching Task (Jee mains)

01 $(3x^2y - 2xy + 5) + (-2x^2y + 3xy - 5)$

$= x^2y + xy$ Ans: B

02 $(a + 2b - 3c) + (-3a + b + 2c) + (2a - 3b + c)$

$= 0$ Ans B

03 $(-x + 2y + 3z) + (3x - y + 2z) + (2x + 3y - z)$

$= 4x + 4y + 4z$ Ans A

04 $(5ax - 7by + cz) + (ax + 2by - cz) +$
$(-3ax + 2by + 3cz)$

$= 3ax - 3by + 3cz$ Ans: D

06 $(5x^2 + 7y - 6z^2) + (4y + 3x^2) +$
$(9x^2 + 2z^2 - 9y) + (2y - 2x^2)$

$= 15x^2 + 4y - 4z^2$ Ans: A

07 $(y^3 - 3xy^2 - 4x^2y) - (x^3 + 2x^2 + 6xy^2 - y^3)$

$= y^3 - 3xy^2 - 4x^2y - x^3 - 2x^2 - 6xy^2 + y^3$

$= 2y^3 - 9xy^2 - 4x^2y - x^3 - 2x^2$ Ans: D

08 $(A-C)-(B-D)$

$A-C = x^2 - x - x^3 - x^2 - x = -2x - x^3$

$B-D = \frac{x^3}{3} - \frac{x}{2} - x^3 - x = -\frac{2x^3}{3} - \frac{3x}{2}$

$(A-C)-(B-D) = -2x - x^3 + \frac{2x^3}{3} + \frac{3x}{2}$

$= -\frac{1}{3}x^3 - \frac{x}{2}$ Ans D

09 No. of students in section C

$= (5x-8y+3z) - [(x+2y-3z)+(2x-3y+z)]$

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

$= 2x - 7y + 5z$ Ans: C

10 $(-2a^4 + 3a^3 + a^2 + 2) - (a^4 - 3a^3 - a^2 - 1)$

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

$= -3a^4 + 6a^3 + 2a^2 + 3$ Ans: B

11. $A+B+C = 2x - y + 3xy + 2x + 2xy + 3y + xy$

$= 4x + 2y + 6xy$

$= 2(2x + y + 3xy)$ Ans: A | B

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

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

$= 2(a + 3b - 6c - 6)$ Ans: B, C

13 Statement I: $4x^2 - 5x + 3 - 2x^2 + 2x + 2$

$= 2x^2 - 3x + 5$ (False)

Statement II: Conceptual (true) Ans: (2) D

14. Statement I:

$2x^4 + 5x^3 + 6x^4 - 7x^3 + 5 = 8x^4 - 2x^3 + 5$ (3)

Coefficient of $x^2 = 0$ (True)

Statement II:

$2x^4 + 5x^3 + 6x^4 - 7x^3 + 5 = 8x^4 - 2x^3 + 5$

(False)

Ans: C

15 Assertion: Mathematically (True)

Reason: Conceptual (True) Ans A

16. Assertion: $8x^2 + 2x - 6 \rightarrow$ Degree = 2 (True)

Reason: Conceptual (True) Ans: B

17 $(4x^3 + y^3) - (x^3 + 3y^3)$

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

18 $4x^3 + y^3 + x^3 + 3y^3 = 5x^3 + 4y^3$ Ans: B

19. $F + G + H = x^2y + 2xy^2 - x^2y + 3xy^2 + 2x^2y - xy^2$

$= 2x^2y + 4xy^2$ Ans: B

20 B) $F - H = (x^2y + 2xy^2) - (2x^2y - xy^2)$

$= x^2y + 2xy^2 - 2x^2y + xy^2$

$= -x^2y + 3xy^2 = G.$ Ans: B

21. Clearly Coefficient of $x^2 = 0$ Ans: 0

22 $(4 + 3x + 5 - 4x + 2x^2) - (3x^2 - 5x - x^2 + 2x + 5)$

Coeff. of $x = 3 - 4 + 5 - 2$

$= 8 - 6$

$= 2$ Ans: 2

23 a) $(1 - x + x^2 - 2x^3) + K = x^3$ (4)

$K = x^3 - 1 + x - x^2 + 2x^3 = 3x^2 - x^2 + x - 1$ (r)

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

$= 2y^2 + 2y + 12$ (s)

Ans: r, p, q, s

24 a) $5a^2 + 7b + 3 - 3a^2 + 5b + 3$

$= 2a^2 + 12b + 6$ (s)

b) $63a - 63b - 63b + 63a$

$= 126a - 126b$ (r)

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

d) $3x^2 - 2x - x - 7 + 2x^2 - 3x + 2$

$= 5x^2 - 6x - 5$ (q) Ans: s, r, q, p

LEARNERS TASK (CUQ'S)

01.	$3a - 5b + 6a + 2b = 9a - 3b$	Ans B
02	$3x^2 + 4z - 3x^2 + 0x^2 = 4z$	Ans: A
03	$8pq - 11z - 7z + 11pq = 19pq - 18z$	Ans. D
04	$7x^2y$	Ans. A
05	$4x + 3y$	Ans: B

06 $5x^3 + 5x^2 + 2x + 22$ Ans: C

07 $5x + 3y + 4x - 2y = 9x + y$ Ans: D

08 $(y^2 - x^2) - (x^2 - y^2) = y^2 - x^2 - x^2 + y^2$
$= 2(y^2 - x^2)$
$= -2(x^2 - y^2)$ Ans: A

09. $p + p - q + q + q - p = p + q$ Ans: A

10 $7m - 4n + 3 - 8m - 3 + 2n$
$= -m - 2n$ Ans: C

JEE MAINS

01. $x^2 - xy + y^2 + x^2 + xy + y^2 = 2x^2 + 2y^2$ Ans: C

02 $m^4 + 8m^2n^2 + n^4 - m^4 + 4m^2n^2$
$= 12m^2n^2 + n^4$ Ans: A

03 $x^2 + x + 1 + x^2 - x + 1 + x^2 + x - 1$
$= 3x^2 + x + 1$ Ans: C

04 $(c - 4b) - (5a - 3b + c + 3b - 9a)$
$= c - 4b + 4a - c = 4a - 4b$ Ans: A

05 $(5x^2 - 7x + 2) + K = 7x^2 - 1$
$\Rightarrow K = 7x^2 - 1 - 5x^2 + 7x - 2$
$\Rightarrow K = 2x^2 + 7x - 3$ Ans: C

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

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

08 $6y^3z + z^3 - 4y^2z^2 - 5y^3z - 2y^2z^2 + 3z^3 + 5$ (6)

$= y^3z + 4z^3 - 6y^2z^2 + 5$ Ans: C

09 ~~$5y^3z + z^3$~~

$(5y^3z + 2y^2z^2 - 3z^3 - 5) + K = 6y^3z + z^3 - 4y^2z^2$

$K = 6y^3z + z^3 - 4y^2z^2 - 5y^3z - 2y^2z^2 + 3z^3 + 5$

$= y^3z + 4z^3 - 6y^2z^2 + 5$ Ans: C

10 $2x^3 - 5x^2 - 11x + 2 - 5x^3 + 3x^2 + 8$

$= -3x^3 - 2x^2 - 11x + 10$ Ans: A

JEE ADVANCED

11. $3K - (-3K) = 6K = 2(3K)$ Ans: A, B

12 A) $P + Q = 3x^2 + 5x - 7 - 2x^2 + 4x + 3$

$= x^2 + 9x - 4$ ✓

B) $P - Q = 3x^2 + 5x - 7 + 2x^2 - 4x - 3$

$= 5x^2 + x - 10$ ✓

C) $Q - P = -2x^2 + 4x + 3 - 3x^2 - 5x + 7$

$= -5x^2 - x + 10$ ✓

Ans: A, B, C

~~D) PP~~

13 Statement I: mathematically (True)

Statement II: Conceptual (True) Ans: A

14 Statement I: $5m + 2n - 7 - 3m + 4n - 2 = 2m + 6n - 9$ (True)

Statement II: Conceptual (False) Ans: C

15. Assertion: Mathematically (True)
Reason: Conceptual (True) Ans A

16. Assertion: $2x^2+3x+x^2-5x$
$= 3x^2-2x$ (True)
Reason: Conceptual (False) Ans: C

17. $A+B-C = (x^2+y^2-2xy+3x^2-4xy+7y^2)-(3x^2-4y^2$
$= x^2+y^2-2xy+3x^2-4xy+7y^2-3x^2+4y^2$
$= x^2+12y^2-6xy$ Ans: A

18. $A+B+C = x^2+y^2-2xy+3x^2-4xy+7y^2+3x^2-4y^2$
$= 7x^2-6xy$
Coefficient $= -6$ Ans: B

19. $P+Q = 4x^2+3x-5-2x^2+7x+8$
$= 2x^2+10x+3$ Ans A

20. $P-Q = 4x^2+3x-5+2x^2-7x-8$
$= 6x^2-4x-13$
Degree $= 2$ Ans: B

21. $(4x^4-3x^3+x^2+2)-K = 4x^4-3x^3+x^2$
$K = 4x^4$ $K = 2$ Ans: 2

22. $M+N = 0$ Ans: 0

23 a) $x^3 - 5x^2 + 7x + 2 + 15x^2 + 10x - 7$

$= x^3 + 10x^2 + 17x - 5$ (s)

b) $(a^3 + b^3 - 3a^2b + 7ab^2) - (4a^3 - 3a^2b + ab^2 - b^3)$

$= a^3 + b^3 - 3a^2b + 7ab^2 - 4a^3 + 3a^2b - ab^2 + b^3$

$= -3a^3 + 2b^3 + 6ab^2$ (r)

c) $15xy + 2xy + 4x^2 - 4y^2$

$= 4x^2 + 17xy - 4y^2$ (p)

d) $(a^3 - 3a^2 + 5a + 1) - (5a^3 - 2a^2 + 7)$

$= a^3 - 3a^2 + 5a + 1 - 5a^3 + 2a^2 - 7$

$= -4a^3 - a^2 + 5a - 6$ (q)

Ans: s, r, p, q

24 a) $a^2 + y^2 - y^2 - z^2 = a^2 - z^2$ (r)

b) $5m + 2n + 3m - 4n = 8m - 2n$ (q)

c) 0 (p)

d) $p + 7q$ (s)

Ans: r, q, p, s

⇒ THE END ⇐