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PRACTICE PAPER 01 (2023-24)
ALGEBRAIC EXPRESSIONS AND IDENTITIES
(ANSWERS)

SUBJECT: MATHEMATICS	MAX. MARKS : 30
CLASS : VIII	DURATION : 1 hr

SECTION – A (1 mark)

1. Add $7x^2 + 11x + 8$ and $3x^2 - 6x - 7$.
   Ans: $(7x^2 + 11x + 8) + (3x^2 - 6x - 7)$
   $= (7x^2 + 3x^2) + (11x - 6x) + (8 - 7)$
   $= 10x^2 + 5x + 1$

2. Find the product of $5x^2y$ and $-3x^3y^2$.
   Ans: $(5x^2y) (-3x^3y^2) = 5(-3) (x^2x^3) (y.y^2)$
   $= -15x^{2+3} y^{1+2} = -15x^5y^3$

3. Find the product of a^4b^2 and $(2a^2b)^3$.
   Ans: $(a^4b^2) (2a^2b)^3 = (a^4b^2) [2^3(a^2)^3.b^3]$
   $= 8(a^4. a^6). (b^2.b^3) = 8a^{10}b^5$

4. Find the product of $3x$ and $7x + 2$.
   Ans: Product $= 3x(7x + 2)$
   $= (3x)(7x) + (3x)(2) = 21x^2 + 6x$.

5. Find the product of $-5m^2$ and $4m^2 - 2m + 7$.
   Ans: Product $= -5m^2(4m^2 - 2m + 7)$
   $= (-5m^2) (4m^2) + (-5m^2) (-2m) + (-5m^2)(7)$
   $= -20m^4 + 10m^3 - 35m^2$

SECTION – B (2 marks)

6. Simplify: $5x^3 + 6x^2 + 3x − (−2x^3 + 7x^2 + 3x - 7)$
   Ans: $5x^3 + 6x^2 + 3x - (-2x^3 + 7x^2 + 3x - 7)$
   $= 5x^3 + 6x^2 + 3x + 2x^3 - 7x^2 - 3x + 7$
   $= (5x^3 + 2x^3) + (6x^2 - 7x^2) + (3x - 3x) + 7$
   $= 7x^3 - x^2 + 7$

7. Add $3x(7x^2 − 5x+3)$ and $2(x^3 − 4x^2 + 5)$.
   Ans: $3x(7x^2 − 5x + 3) + 2(x^3 − 4x^2 + 5)$
   $= 21x^3 − 15x^2 + 9x + 2x^3 − 8x^2 + 10$
   $= 21x^3 − 2x^3 − 15x^2 − 8x^2 + 9x + 10$
   $= 23x^3 − 23x^2 + 9x + 10$

8. Multiply 2a + 3b by 7a -5b.
Ans: Product = (2a + 3b) (7a - 5b)
= 2a(7a - 5b) + 3b(7a - 5b)
= $14a^2$ - 10ab + 21ab - $15b^2$
= $14a^2$ + 11ab - $15b^2$.

9. Multiply : ($5a^2$ - 2b) by ($2a^2$ - 3b).
Ans: Product = ($5a^2$ - 2b) ($2a^2$ - 3b)
= $5a^2$($2a^2$ - 3b) - 2b($2a^2$ - 3b)
= $10a^4$ - $15a^2b$ - $4a^2b$ + $6b^2$
= $10a^4$ - $19a^2b$ + $6b^2$

10. Find the Square of 9x – 7xy.
Ans: As per the condition in the question, $(9x – 7xy)^2$
The standard identity = $(a – b)^2 = a^2 – 2ab + b^2$
Where, a = 9x, b = 7xy
Then, $(9x – 7xy)^2 = (9x)^2 – (2 × 9x × 7xy) + (7xy)^2$
= $81x^2 – 126x^2y + 49x^2y^2$

SECTION – C (3 marks)

11. Simplify : $a^2(b^2 - c^2) + b^2(c^2 - a^2) + c^2(a^2 - b^2)$
Ans: $a^2(b^2 - c^2) + b^2(c^2 - a^2) + c^2(a^2 - b^2)$
= $(a^2b^2 − a^2c^2) + (b^2c^2 − b^2a^2) + (c^2a^2 - c^2b^2)$
= $(a^2b^2 − b^2a^2) + (− a^2c^2 + c^2a^2) + (b^2c^2 - c^2b^2)$
= $(a^2b^2 − a^2b^2) + (-c^2a^2 + c^2a^2) + (b^2c^2 - b^2c^2)$
= 0 + 0 + 0 = 0.

12. Subtract $4p^2q – 3pq + 5pq^2 – 8p + 7q – 10$ from $18 – 3p – 11q + 5pq – 2pq^2 + 5p^2q$
Ans: $(18 – 3p – 11q + 5pq – 2pq^2 + 5p^2q) – (4p^2q – 3pq + 5pq^2 – 8p + 7q – 10)$
= $18 – 3p – 11q + 5pq – 2pq^2 + 5p^2q – 4p^2q + 3pq – 5pq^2 + 8p – 7q + 10$
=18+10 -3p+8p -11q – 7q + 5 pq+ 3pq- 2pq^2 – 5pq^2 + 5 p^2 q – 4p^2 q
= $28 + 5p – 18q + 8pq – 7pq^2 + p^2q$

13. Use the identity (x + a) (x + b) = x^2 + (a + b) x + ab to find the following products.
(i) (4x + 5) (4x – 1) (ii) (2x + 5y) (2x + 3y)
Ans: (i) (4x + 5) (4x – 1)
= $16x^2$ + [5 + (–1)]4x + 5(–1)
= $16x^2$ +16x – 5
(ii) (2x + 5y) (2x + 3y)
= $4x^2$ + (5y + 3y)2x + (5y)(3y)
= $4x^2$ + 16xy + $15y^2$

14. Use a suitable identity to get each of the following products.
(i) (2y + 5) (2y + 5) (ii) (2a – 7) (2a – 7)
Ans: (i) (2y + 5) (2y + 5) = $(2y + 5)^2$
= $4y^2$ + 20y + 25

Using $(a + b)^2 = a^2 + b^2 + 2ab$
(ii) $(2a - 7)(2a - 7) = (2a - 7)^2$
$= 4a^2 - 28a + 49$
Using $(a - b)^2 = a^2 + b^2 - 2ab$

15. Simplify the following expression and evaluate it for a = -1.
   $5a^2(a - 2) - 2a^3(a + 4) - 5a(a - 2)$
   Ans: $5a^2(a - 2) - 2a^3(a + 4) - 5a(a - 2)$
   $= [5a^2 \times a - 5a^2 \times 2] - [2a^3 \times a + 2a^3 \times 4] - [5a \times a - 5a \times 2]$
   $= (5a^3 - 10a^2) - (2a^4 + 8a^3) - (5a^2 - 10a)$
   $= 5a^3 - 10a^2 - 2a^4 - 8a^3 - 5a^2 + 10a$
   $= -2a^4 - 3a^3 - 15a^2 + 10a$
   $= -2(-1)^4 - 3(-1)^3 - 15(-1)^2 + 10(-1)$ [Putting a = -1]
   $= -2 + 3 - 15 - 10 = -27 + 3 = -24$