

SATISH CHANDRA MEMORIAL SCHOOL

Class VII — Mathematics

WORKSHEET:

Section A — Terms, Factors and Coefficients (1 mark each)

Q1. For each expression below, write the number of terms, and the coefficient of the terms underlined

Expression	Number of terms	Coefficient of the bracketed term
$7x^2 - 3x + 5x^2$		
$4ab - 9b + 2ab$		
$-6x + 11y - y$		
$3p^2q - 5pq^2 + pq - 8pq$		

Q2. State whether the following pairs are LIKE terms or UNLIKE terms.

Pair of terms	Like / Unlike
$7xy$ and $-3xy$	
$5x^2$ and $5x$	
$-8pq$ and $2qp$	
$9a^2b$ and $9ab^2$	

Section B — Classifying Expressions (1 mark each)

Q3. Classify each expression as a monomial, binomial, trinomial, or polynomial.

Expression	Type
$5xy$	
$3x + 7y$	
$x^2 - 4x + 4$	
$2a + 3b - c + 5$	
$-9pqr$	

Section C — Addition and Subtraction (2 marks each)

Q4. Add the algebraic expressions: $3x + 5y - 2z$ and $x - 3y + 4z$

Q5. Add: $7a^2 - 4ab + 3b^2$, $-2a^2 + ab - b^2$, and $5a^2 - 3ab$

Q6. Subtract $4x - 3y + 2z$ from $9x + 5y - z$

Q7. Subtract the sum of $3p - 2q$ and $-p + 5q$ from $8p - q$

Q8. Simplify: $5x^2 - 3x + 7 - (2x^2 + 4x - 6)$

Section E — Word Problems (3 marks each)

Q15. The length of a rectangle is $(3x + 5)$ cm and its breadth is $(2x - 1)$ cm. Find an expression for its perimeter, in simplest form.

Q16. Rahul has $(5x + 3)$ marbles and Simran has $(2x - 4)$ marbles. Together they receive $(x + 6)$ more marbles. Find the total number of marbles, in simplest form.

Q17. The sides of a triangle are $(2x + 1)$ cm, $(3x - 2)$ cm and $(x + 4)$ cm. Find the expression for its perimeter. If $x = 5$, find the actual perimeter.

ANSWER KEY — ALGEBRAIC EXPRESSIONS

Section A

Q1.

Expression	Number of terms	Coefficient
$7x^2 - 3x + 5$	3	7
$4ab - 9b + 2a$	3	4
$-6x + 11y - y$	3	11
$3p^2q - 5pq^2 + pq - 8$	4	-5

Q2.

Pair of terms	Answer
$7xy$ and $-3xy$	Like terms
$5x^2$ and $5x$	Unlike terms
$-8pq$ and $2qp$	Like terms
$9a^2b$ and $9ab^2$	Unlike terms

Section B

Q3.

Expression	Type
$5xy$	Monomial
$3x + 7y$	Binomial
$x^2 - 4x + 4$	Trinomial
$2a + 3b - c + 5$	Polynomial (4 terms)
$-9pqr$	Monomial

Section C

Q4. $3x + 5y - 2z$ and $x - 3y + 4z$

Adding like terms separately: x-terms give $3x + x = 4x$; y-terms give $5y - 3y = 2y$; z-terms give $-2z + 4z = 2z$.

Answer: $4x + 2y + 2z$

Q5. $7a^2 - 4ab + 3b^2$, $-2a^2 + ab - b^2$, $5a^2 - 3ab$

Adding a^2 terms: $7a^2 - 2a^2 + 5a^2 = 10a^2$. Adding ab terms: $-4ab + ab - 3ab = -6ab$. Adding b^2 terms: $3b^2 - b^2 = 2b^2$.

Answer: $10a^2 - 6ab + 2b^2$

Q6. Subtract $4x - 3y + 2z$ from $9x + 5y - z$

Change the sign of every term being subtracted, then add: $(9x + 5y - z) - (4x - 3y + 2z) = 9x - 4x + 5y + 3y - z - 2z$.

Answer: $5x + 8y - 3z$

Q7. Subtract the sum of $3p - 2q$ and $-p + 5q$ from $8p - q$

First find the sum: $(3p - 2q) + (-p + 5q) = 2p + 3q$. Then subtract this from $8p - q$: $(8p - q) - (2p + 3q) = 8p - 2p - q - 3q$.

Answer: $6p - 4q$

Q8. Simplify: $5x^2 - 3x + 7 - (2x^2 + 4x - 6)$

Remove the bracket by changing signs: $5x^2 - 3x + 7 - 2x^2 - 4x + 6$. Collect like terms: $(5x^2 - 2x^2) + (-3x - 4x) + (7 + 6)$.

Answer: $3x^2 - 7x + 13$

Section D

Q9. $4x^2 \times 3x^3y = 12x^5y$

Q10. $-5ab \times 2a^2b^3 = -10a^3b^4$

Q11. $3x \times (2x + 5y - 4)$

Multiply $3x$ by each term inside the bracket: $3x \times 2x = 6x^2$; $3x \times 5y = 15xy$; $3x \times (-4) = -12x$.

Answer: $6x^2 + 15xy - 12x$

Q12. $-2p^2q \times (3p - 4q + pq)$

Multiply each term: $-2p^2q \times 3p = -6p^3q$; $-2p^2q \times (-4q) = 8p^2q^2$; $-2p^2q \times pq = -2p^3q^2$.

Answer: $-6p^3q + 8p^2q^2 - 2p^3q^2$

Q13. $(x + 3)(x + 7)$

Multiply each term of the first bracket by each term of the second: $x \cdot x + x \cdot 7 + 3 \cdot x + 3 \cdot 7 = x^2 + 7x + 3x + 21$.

Answer: $x^2 + 10x + 21$

Q14. $(2a - 5)(a + 4)$

Multiply each term: $2a \cdot a + 2a \cdot 4 - 5 \cdot a - 5 \cdot 4 = 2a^2 + 8a - 5a - 20$.

Answer: $2a^2 + 3a - 20$

Section E

Q15. Length = $(3x + 5)$ cm, Breadth = $(2x - 1)$ cm

Perimeter = $2 \times (\text{length} + \text{breadth}) = 2 \times [(3x + 5) + (2x - 1)] = 2 \times (5x + 4)$.

Answer: Perimeter = $(10x + 8)$ cm

Q16. Rahul: $(5x + 3)$, Simran: $(2x - 4)$, plus $(x + 6)$ more

Total = $(5x + 3) + (2x - 4) + (x + 6)$. Adding x-terms: $5x + 2x + x = 8x$. Adding constants: $3 - 4 + 6 = 5$.

Answer: Total marbles = $(8x + 5)$

Q17. Sides: $(2x + 1)$, $(3x - 2)$, $(x + 4)$ cm

Perimeter = $(2x + 1) + (3x - 2) + (x + 4) = 6x + 3$. Substituting $x = 5$: $6(5) + 3 = 30 + 3$.

Answer: Perimeter = $(6x + 3)$ cm; at $x = 5$, Perimeter = 33 cm