

Algebraic Expressions

MCQ Test, Set 03

Time: 30 minutes

Maximum marks: 25

Name: _____ Class: _____ Date: _____

- There are 25 questions. Each has exactly one correct answer: choose A, B, C or D.
- Each correct answer carries 1 mark. There is no negative marking.
- The key sheet and worked solutions are at the end of this test.

- A symbol which has a fixed value is called a
A. variable **B.** term **C.** co-efficient **D.** constant
- "10 less than half of b " in symbolic form is
A. $\frac{b-10}{2}$ **B.** $\frac{b}{2} - 10$ **C.** $10 - \frac{b}{2}$ **D.** $2b - 10$
- The number of terms in $2m^2n + \frac{7n}{6} - 5m^2 + 9m + 1$ is
A. 6 **B.** 5 **C.** 7 **D.** 4
- $10mt^3$ written as a product of its factors is
A. $10 \times m \times t \times t \times t$ **B.** $10 + m + t + t + t$
C. $10 \times m \times t \times 3$ **D.** $10 \times m \times t$
- The co-efficient of xy^3 in $-\frac{5}{4}xy^3z^2$ is
A. $-\frac{5}{4}$ **B.** $-\frac{5}{4}z^2$ **C.** z^2 **D.** $\frac{5}{4}z^2$
- Which of the following is a like term of $5yz^3$?
A. $5y$ **B.** $5rz^3$ **C.** $9z^3y$ **D.** $5y^3z$
- $\frac{p}{5} + \frac{p}{4} =$
A. $\frac{9p}{20}$ **B.** $\frac{9p^2}{20}$ **C.** $\frac{2p}{9}$ **D.** $\frac{p}{20}$
- $5t - 6t =$
A. t **B.** $-t$ **C.** $-11t$ **D.** $11t$
- Which of the following is a binomial?
A. $2y^2 + 3x^2y$ **B.** $-\frac{5}{3}x^3$
C. $6y^2 + 8x^2y^2 + 7y + 8x^2$ **D.** $7x^2y + 6x^2y^2 - 3y$
- Which of the following statements is true?
A. Every polynomial is a multinomial. **B.** $z + \frac{9}{z}$ is a polynomial.
C. Every multinomial is a polynomial. **D.** $4\sqrt{z}$ is a monomial.

11. The degree of $12a^4b^3m^2$ is
A. 12 **B.** 3 **C.** 9 **D.** 4
-
12. The degree of $-5mn^4 - 6 - 7m^4n^3 + 9mn^3$ is
A. 5 **B.** 7 **C.** 16 **D.** 4
-
13. The value of $q^2 - 2qr + r^2$ when $q = 2$ and $r = -1$ is
A. 7 **B.** 6 **C.** -9 **D.** 9
-
14. The value of $p^3 + p$ when $p = -1$ is
A. -4 **B.** -2 **C.** 2 **D.** 0
-
15. The sum of $5x^2 + 5z^2 + 8xz$ and $-6x^2 - 2z^2 + 6xz$ is
A. $-11x^2 + 3z^2 + 14xz$ **B.** $x^2 + 3z^2 + 14xz$ **C.** $-x^2 + 3z^2 + 14xz$ **D.** $11x^2 + 7z^2 + 2xz$
-
16. The sum of $-x + 2y$, $9y + 9t$ and $2x - 8t$ is
A. $3x + 11y + t$ **B.** $-3x + 11y + 17t$ **C.** $-x + 11y + t$ **D.** $x + 11y + t$
-
17. Subtract $-8a$ from $11a$.
A. $-19a$ **B.** $-3a$ **C.** $3a$ **D.** $19a$
-
18. If $A = 4b^2 - 5b + 5$ and $B = 6b^2 - 7b + 1$, then $2A - B =$
A. $-2b^2 + 2b + 4$ **B.** $14b^2 - 17b + 11$ **C.** $2b^2 - 3b + 9$ **D.** $2b^2 - 17b + 11$
-
19. Subtract $6a^2 + 3ab - 6$ from $3a^2 + 4$.
A. $3a^2 + 3ab - 10$ **B.** $-3a^2 - 2 + 3ab$ **C.** $9a^2 - 2 + 3ab$ **D.** $-3a^2 + 10 - 3ab$
-
20. $6x^2y \times 3xy^3 \times 3xy^2 =$
A. $12x^4y^6$ **B.** $54x^4y^3$ **C.** $54x^4y^6$ **D.** $54x^2y^6$
-
21. $-2b^2c(-8bc + 6b^2c + 2) =$
A. $16b^3c^2 + 6b^2c + 2$ **B.** $16b^3c^2 - 12b^4c^2 - 4b^2c$
C. $16b^2c - 12b^4c^2 - 4b^2c$ **D.** $16b^3c^2 - 12b^4c^2 + 4b^2c$
-
22. $(4a - 9)(a + 7) =$
A. $4a^2 - 63$ **B.** $4a^2 + 19a + 63$ **C.** $4a^2 - 19a - 63$ **D.** $4a^2 + 19a - 63$
-
23. $(a - 6c)(a + 2c) =$
A. $a^2 - 4ac - 12c^2$ **B.** $a^2 + 4ac - 12c^2$ **C.** $a^2 - 12c^2$ **D.** $a^2 - 4ac + 12c^2$
-
24. $2x(2x + 2y) - 2y(3x - 4y) =$
A. $4x^2 - 2xy + 8y^2$ **B.** $4x^2 - 2xy - 8y^2$ **C.** $-4x^2 + 2xy - 8y^2$ **D.** $4x^2 + 10xy - 8y^2$
-
25. $2a + \{5c - (3c - 4a)\} =$
A. $-2a + 2c$ **B.** $-2a + 8c$ **C.** $6a + 2c$ **D.** $-2a - 2c$
-

Key sheet

1. D	2. B	3. B	4. A	5. B
6. C	7. A	8. B	9. A	10. A
11. C	12. B	13. D	14. B	15. C
16. D	17. D	18. C	19. D	20. C
21. B	22. D	23. A	24. A	25. C

Solutions

1. A symbol which has a fixed value is called a

A symbol with a fixed value is a constant, e.g. 15, -9, 0.

Ans: (D) constant

2. "10 less than half of b " in symbolic form is

Half of b is $\frac{b}{2}$; 10 less means subtract 10.

So it is $\frac{b}{2} - 10$.

Ans: (B) $\frac{b}{2} - 10$

3. The number of terms in $2m^2n + \frac{7n}{6} - 5m^2 + 9m + 1$ is

Terms are separated by + and - signs.

The terms are $2m^2n$, $\frac{7n}{6}$, $-5m^2$, $9m$, 1.

So there are 5 terms.

Ans: (B) 5

4. $10mt^3$ written as a product of its factors is

t^3 means t multiplied 3 times.

$$10mt^3 = 10 \times m \times t \times t \times t$$

Ans: (A) $10 \times m \times t \times t \times t$

5. The co-efficient of xy^3 in $-\frac{5}{4}xy^3z^2$ is

$$-\frac{5}{4}xy^3z^2 = \left(-\frac{5}{4}z^2\right) \times xy^3$$

So the co-efficient of xy^3 is $-\frac{5}{4}z^2$.

Ans: (B) $-\frac{5}{4}z^2$

6. Which of the following is a like term of $5yz^3$?

Like terms have the same literal factors.

$9z^3y$ has the literal factors $z^3y = yz^3$, the same as $5yz^3$.

Ans: (C) $9z^3y$

7. $\frac{p}{5} + \frac{p}{4} =$

$$\frac{p}{5} + \frac{p}{4}$$

$$= \left(\frac{1}{5} + \frac{1}{4}\right)p$$

$$\text{For } p: \frac{1}{5} + \frac{1}{4} = \frac{4+5}{20} = \frac{9}{20}$$

$$= \frac{9p}{20}$$

Ans: (A) $\frac{9p}{20}$

8. $5t - 6t =$

$$5t - 6t$$

$$= (5 - 6)t$$

$$= -t$$

Ans: (B) $-t$

9. Which of the following is a binomial?

A binomial has two monomials.

$2y^2 + 3x^2y$ has two terms.

Ans: (A) $2y^2 + 3x^2y$

10. Which of the following statements is true?

A polynomial has one or more monomials; a multinomial has one or more terms.

So all polynomials are multinomials, but not the other way round.

Ans: (A) Every polynomial is a multinomial.

11. The degree of $12a^4b^3m^2$ is

Add the powers of the variables:

$$4 + 3 + 2 = 9$$

Ans: (C) 9

12. The degree of $-5mn^4 - 6 - 7m^4n^3 + 9mn^3$ is

Degrees of the terms are 5, 0, 7, 4.

The greatest is 7.

Ans: (B) 7

13. The value of $q^2 - 2qr + r^2$ when $q = 2$ and $r = -1$ is

Put $q = 2$ and $r = -1$:

$$(2)^2 - 2(2)(-1) + (-1)^2$$

$$= 4 + 4 + 1$$

$$= 9$$

Ans: (D) 9

14. The value of $p^3 + p$ when $p = -1$ is

Put $p = -1$:

$$(-1)^3 + (-1)$$

$$= -1 - 1$$

$$= -2$$

Ans: (B) -2

15. The sum of $5x^2 + 5z^2 + 8xz$ and $-6x^2 - 2z^2 + 6xz$ is

$$\begin{aligned} & 5x^2 + 5z^2 + 8xz - 6x^2 - 2z^2 + 6xz \\ &= (5 - 6)x^2 + (5 - 2)z^2 + (8 + 6)xz \\ &= -x^2 + 3z^2 + 14xz \end{aligned}$$

Ans: (C) $-x^2 + 3z^2 + 14xz$

16. The sum of $-x + 2y$, $9y + 9t$ and $2x - 8t$ is

Add the like terms column by column:

$$\begin{array}{rrr} -x & +2y & \\ & 9y & +9t \\ 2x & & -8t \\ \hline x & +11y & +t \end{array}$$

Ans: (D) $x + 11y + t$

17. Subtract $-8a$ from $11a$.

$$\begin{aligned} & (11a) - (-8a) \\ &= 11a + 8a \\ &= (11 + 8)a \\ &= 19a \end{aligned}$$

Ans: (D) $19a$

18. If $A = 4b^2 - 5b + 5$ and $B = 6b^2 - 7b + 1$, then $2A - B =$

$$\begin{aligned} & 2(4b^2 - 5b + 5) - (6b^2 - 7b + 1) \\ &= 8b^2 - 10b + 10 - 6b^2 + 7b - 1 \\ &= (8 - 6)b^2 + (-10 + 7)b + (10 - 1) \\ &= 2b^2 - 3b + 9 \end{aligned}$$

Ans: (C) $2b^2 - 3b + 9$

19. Subtract $6a^2 + 3ab - 6$ from $3a^2 + 4$.

Change the signs of $6a^2 + 3ab - 6$ and add:

$$\begin{array}{rrr} 3a^2 & +4 & \\ 6a^2 & -6 & +3ab \\ (-) & (+) & (-) \\ \hline -3a^2 & +10 & -3ab \end{array}$$

$$= -3a^2 + 10 - 3ab$$

Ans: (D) $-3a^2 + 10 - 3ab$

20. $6x^2y \times 3xy^3 \times 3xy^2 =$

Multiply the numbers and add the powers of the same letters:

$$\begin{aligned} &= (6 \times 3 \times 3)(x^2 \times x \times x)(y \times y^3 \times y^2) \\ &= 54x^4y^6 \end{aligned}$$

Ans: (C) $54x^4y^6$

21. $-2b^2c(-8bc + 6b^2c + 2) =$

Multiply $-2b^2c$ with every term inside the bracket:

$$\begin{aligned} &= (-2b^2c)(-8bc) + (-2b^2c)(6b^2c) + (-2b^2c)(2) \\ &= 16b^3c^2 - 12b^4c^2 - 4b^2c \end{aligned}$$

Ans: (B) $16b^3c^2 - 12b^4c^2 - 4b^2c$

22. $(4a - 9)(a + 7) =$

$$\begin{aligned} (a + b)(c + d) &= ac + ad + bc + bd \\ &= 4a^2 + 28a - 9a - 63 \\ &= 4a^2 + 19a - 63 \end{aligned}$$

Ans: (D) $4a^2 + 19a - 63$

23. $(a - 6c)(a + 2c) =$

$$\begin{aligned} (a + b)(c + d) &= ac + ad + bc + bd \\ &= a^2 + 2ac - 6ac - 12c^2 \\ &= a^2 - 4ac - 12c^2 \end{aligned}$$

Ans: (A) $a^2 - 4ac - 12c^2$

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

Multiply out each bracket and add like terms:

$$\begin{aligned} &= 4x^2 + 4xy - 6xy + 8y^2 \\ &= 4x^2 + (4 - 6)xy + 8y^2 \\ &= 4x^2 - 2xy + 8y^2 \end{aligned}$$

Ans: (A) $4x^2 - 2xy + 8y^2$

25. $2a + \{5c - (3c - 4a)\} =$

Remove the round brackets first, then the curly brackets:

$$\begin{aligned} &= 2a + \{5c - 3c + 4a\} \\ &= 2a + \{2c + 4a\} \\ &= 2a + 2c + 4a \\ &= 6a + 2c \end{aligned}$$

Ans: (C) $6a + 2c$
