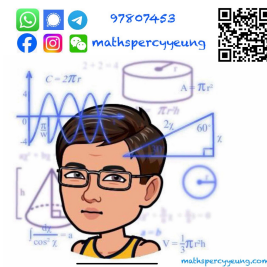


Chapter 2 Polynomials



Multiple Choice Questions

1. Which of the following is a monomial?

- A. $a - b$ B. $-a + b$ C. $-a - b$ D. $-a \times (-b)$

2. Which of the following is a monomial / are monomials?

- I. n^2 II. mn^2 III. $m + n^2$

- A. II only
B. I and II
C. II and III
D. I, II and III

3. Which of the following is not a monomial?

- A. abc B. ac^2 C. ab^2c D. b^{ac}

4. Which of the following monomials has a degree of 3?

- A. abc B. a^2b^3 C. bc^3 D. $a^3b^3c^3$

5. Arrange the following monomials in descending order of their degrees.

- I. 48 II. a^4b^8 III. $8a^2b^8$

- A. I, II, III
B. I, III, II
C. II, III, I
D. III, I, II

6. Which of the following is a trinomial?

- A. $3xyz$ B. $3x^3 + 3$ C. $3y^3 + 3xy^2$ D. $6xy^2 + 2xy + 3$

7. The constant term of the polynomial $6x^3y^3 + 5x^2y - 4xy - 10$ is

- A. -10. B. -4. C. 5. D. 6.

8. The degree of the polynomial $5a^3 + 6ab^4 - 8a^3b^4 - 1$ is

- A. 5. B. 6. C. 7. D. 12.

9. The degree of the polynomial $-8x^3 + 6x^2 - x^4$ is
 A. 2. B. 3. C. 4. D. 6.
10. Arrange $1 + x^3 + x^2 + 6x + 5x^4$ in descending powers of x .
 A. $1 + 6x + x^2 + x^3 + 5x^4$ B. $5x^4 + 6x + x^3 + x^2 + 1$
 C. $5x^4 + x^3 + x^2 + 6x + 1$ D. $6x + 5x^4 + x^3 + x^2 + 1$
11. Which of the following is arranged in descending powers of c ?
 A. $c^4 + 6c - c^5$ B. $6c^4 - 4c^2 + 6$
 C. $5c^3 - c^2 + c^5$ D. $7 + c^2 - 3c^3$
12. Which of the following polynomials has the same number of terms as its degree?
 A. $a^3 + b$ B. $a^2b - b$ C. $25a^2 + b$ D. $a^2c + bc$
13. Simplify $(-2y + 2x) + (2y - 2x)$.
 A. 0 B. $2x$ C. $2y$ D. $4x + 4y$
14. Simplify $(7a^2 + 8a) - (5a^2 + 3a)$.
 A. $2a^2 - 5a$ B. $2a^2 + 5a$ C. $12a^2 - 11a$ D. $12a^2 + 11a$
15. Simplify $(-ac + d^2) - (ac - d^2)$.
 A. $2d^2$ B. $ac - d^2$ C. $2ac - 2d^2$ D. $-2ac + 2d^2$
16. Simplify $(3c^2 + 2c) + (c^2 + 7c + 4)$.
 A. $3c^2 + 9c + 4$ B. $4c^2 + 9c + 4$ C. $4c^2 + 7c + 6$ D. $4c^2 + 7c + 4$
17. Simplify $(2 + k^2 + 2k) + (6 - 3k + 2k^2)$.
 A. $8 - 2k + 4k^2$ B. $8 - k + 3k^2$ C. $3k^2 + k + 8$ D. $4k^2 - 2k - 8$
18. Simplify $(-3x^2 + x - 1) - (x^2 + 2x + 2)$.
 A. $x^2 - 4x + 1$ B. $-x^2 + 3x - 3$ C. $-x^2 + 4x + 3$ D. $-4x^2 - x - 3$
19. Simplify $(6t - 3t^2 + 7) - (7 - 2t - 2t^2)$.
 A. $t^2 - 8t$ B. $5t^2 - 8t$ C. $-t^2 + 8t$ D. $-5t^2 + 8t$
20. Simplify $(7m^2n - 8mn^2 + 6mn) + (3mn + mn^2 - m^2n)$.

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- A. $8m^2n + 9mn + 7mn^2$ B. $8m^2n - 9mn - 7mn^2$
C. $6m^2n + 9mn - 7mn^2$ D. $6m^2n + 9mn + 7mn^2$

21. Simplify $(g^2 + 2g) + (3g - 2g^2) - (6g^2 + 4g)$.

- A. $-2g^2 + 4g$ B. $2g^2 - 4g$ C. $-7g^2 + g$ D. $7g^2 - g$

22. Simplify $(9a - 3a^2) + (6a - 5a^2) + (3a + 2a^2)$.

- A. $9a - 8a^2$ B. $20a - 8a^2$ C. $-8a^2 + 18a$ D. $-6a^2 + 18a$

23. Expand $(f)(f+3)$.

- A. $4f$ B. $2f+3$ C. f^2+3 D. f^2+3f

24. Expand $(\frac{2a^2}{9})(72a^2 - 9a)$.

- A. $16a^2 - 2a$ B. $16a^2 + 2a^3$ C. $16a^4 - 2a^3$ D. $-16a^4 - 2a$

25. Expand $(e^2 - e - 1)(2e)$.

- A. $2e^3 + 2e^2 + 2e$ B. $2e^3 - 2e^2 - 2e$
C. $-2e^3 + 2e^2 - 2e$ D. $-2e^3 - 2e^2 + 2e$

26. Expand $-4s(-s^2 + 2s + 6)$.

- A. $4s^3 + 2s^2 + 6$ B. $4s^3 - 8s^2 - 24s$
C. $-4s^3 + 2s^2 + 6s$ D. $-4s^3 + 8s^2 + 24s$

27. Expand $(x - 4)(x - 2)$.

- A. $x^2 - 2x - 8$ B. $x^2 - 2x + 8$
C. $x^2 - 6x + 8$ D. $x^2 + 6x + 8$

28. Expand $(3f - 2)(2 - 4f)$.

- A. $-12f^2 + 14f - 4$ B. $-12f^2 + 14f + 4$
C. $-12f^2 + 2f - 4$ D. $-12f^2 - 2f - 4$

29. Expand $(p-1)(p^2+1)$.

- A. $p^3 + p - 1$ B. $p^3 - p^2 - 1$ C. $p^3 - p^2 + p - 1$ D. $p^3 - p^2 - p - 1$

30. Expand $(3a-1)(3a^2-2a-1)$.

- A. $9a^3 - 9a^2 - a + 1$ B. $9a^3 - 9a^2 + 5a + 1$
 C. $9a^3 + 3a^2 - 3a - 1$ D. $9a^3 - 3a^2 - 5a - 1$

31. Expand $(1-2d)^2(d-3)$.

- A. $4d^3 + 12d^3 - d + 3$ B. $4d^3 - 12d^3 + d - 3$
 C. $4d^3 + 16d^2 + 13d - 3$ D. $4d^3 - 16d^2 + 13d - 3$

32. Expand $(3y-1)(2+y)(5y+2)$.

- A. $40y^2 - 2y - 4$ B. $15y^3 + 21y^2 - 4$
 C. $15y^3 + 31y^2 - 4$ D. $15y^3 + 31y^2 - 24y - 4$

33. After expanding $(3x-3)(4x+5)$, what is the constant term?

- A. 5 B. 15 C. -3 D. -15

34. Simplify $(4x-3)(6-x) - x(x-2)$.

- A. $-2x^2 + 19x + 18$ B. $-4x^2 + 19x - 18$
 C. $-5x^2 + 29x - 18$ D. $-5x^2 + 27x - 16$

Level 1

1. Write down the number of terms in each of the following polynomials.

- (a) $4x^2 + 1$ (b) $9x^3 + 4x - 2x^2 + 9$ (c) $8x^3y + 4xy^2 - 3y + 2x - 1$

2. For each of the following polynomials, write down the coefficient of x^3 and the constant term.

- (a) $3x^4 + 3x^3 + 16$ (b) $24x^4 - x^3 + 4x - 3$ (c) $-9x^3 + x^2$

3. Write down the degree of each of the following polynomials.

- (a) $4x - 6$ (b) $5x^2 - 9x^7 + 3x^4 - x + 7$ (c) $15xy + x - 6$

4. Write down the following according to the polynomial $9x^3 + 2xy - 7x^2y^2 - 6$.

- (a) The number of terms (b) The coefficient of x^3 (c) The coefficient of xy
 (d) The coefficient of x^2y^2 (e) The constant term (f) The degree

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5. Arrange the polynomial $3x - 7 + 2x^4 - 5x^2$
(a) in ascending powers of x . (b) in descending powers of x .
6. Arrange the polynomial $3 - 6x^4 + 3x^2 - 8x^3$
(a) in ascending powers of x . (b) in descending powers of x .
7. Simplify the following.
(a)
$$\begin{array}{r} 4y + 7 \\ +) \quad 2y - 5 \\ \hline \end{array}$$
 (b)
$$\begin{array}{r} 4a - 7b \\ -) \quad 3a + 2b \\ \hline \end{array}$$
8. Simplify the following.
(a) $(3y + 5) + (8y - 7)$ (b) $(-a^2 + 4a - 7) - (5a^2 - 6a + 14)$
9. Simplify the following.
(a) $(-2x^2 + x + 7) + (2x^2 - 7x - 2)$ (b) $(7 - 5n^2) - (n - 1 - 5n^2)$
10. Find the sum of $x^2 - 6xy + y^2$ and $3x^2 - 4xy - 2y^2$.
11. Expand the following.
(a) $5(x - 1)$ (b) $(x + 4)(x)$ (c) $5x^2(2x - 1)$ (d) $-2x^2(5 - x)$
12. Expand $(7x^2 - 5)(4x^2)$.
13. Expand $(2x^3 - 6x + 7)x$.
14. Expand $(4x^2 + 2x - 7)(3x)$.
15. Expand $(7x + 2y)(5x - y)$.
16. Find the product of $x^2 + 2x + 1$ and $4x - 3$.
17. Find the product of $5y - 1 + 2y^2$ and $y + 3$.
18. Expand $(x - y)(x^2 + xy + y^2)$.
19. Expand $(4x + 1)^2$.
20. Expand $(3 - x)^2$.
21. Expand $(3x - 2)^2$.

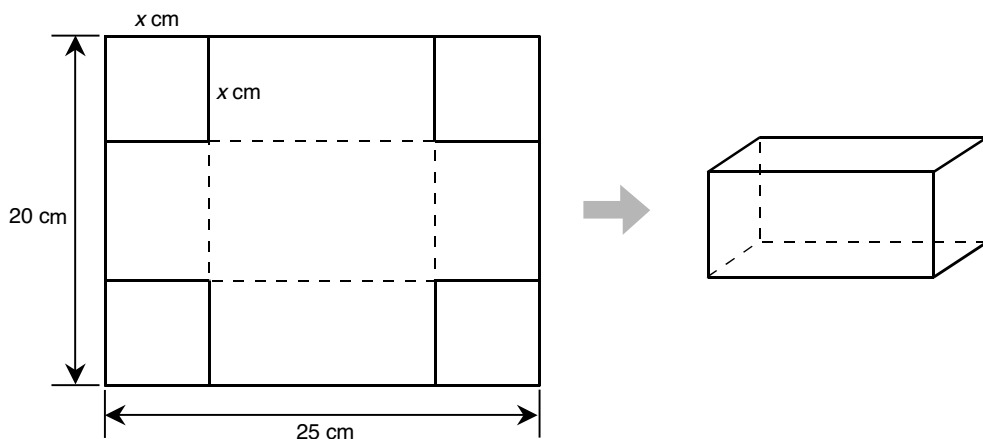
Level 2

22. Simplify the following.
(a) $(2mn + m) + (5mn - 7m)$ (b) $(7xy + 2x^2) - (4xy - x^2)$
23. Simplify the following.
(a) $(3h^3k^2 + 4hk - 2h^2k) + (2hk - 4h^2k - 2h^3k^2)$
(b) $(5x^4 - 2x^2 + x - 7) - (2x^3 + x^2 - 5)$

24. Simplify $(5x^3 - 7x^2 + 8 - 2x) + 3(x^3 + 3x^2 - x + 1)$.
25. Simplify $\frac{1}{3}(2y^3 - 4y - 3) - \frac{1}{3}(y^3 + y - 3y^2) - (\frac{1}{3}y^3 - \frac{2}{3}y)$.
26. Expand $(x^2 + 3x - 1)(x + 2)$.
27. Expand $(3a + 2b)(a^2 - b - 1)$.
28. Expand $(a^2 + 2a + 4)(2a^2 + 3a - 1)$.
29. Expand $(2a^2 - 3a + 5)(1 - 5a + 3a^2)$.
30. Expand $(a + 1)(a + 2)(a + 3)$.
31. Expand $(2a + 1)(a - 1)(3a + 5)$.
32. (a) Expand $(a + b)(a - b)$.
 (b) Hence, find the values of the following without using a calculator.
 (i) $91^2 - 9^2$ (ii) $456^2 - 455^2$
33. (a) Expand $(x + y)(x^2 - xy + y^2)$.
 (b) Hence, find the value of $6^3 + 2^3$ without using a calculator.
34. (a) Expand $(x - y)(x + y)(x^2 + y^2)$.
 (b) Hence, find the value of $6^4 - 2^4$ without using a calculator.

Level 3

35. The figure shows a piece of rectangular card with a length of 25 cm and a width of 20 cm. A small square with sides of x cm each is cut from each corner of the card. Then, the card is folded along the dotted lines to form a rectangular container.



- (a) Express, in terms of x , the length, width and height of the rectangular container.
 (b) Express, in terms of x , the capacity of the rectangular container.