CHAPTER P5

Algebraic Expressions

Multiple-Choice Old Exam Questions

28 questions • 3 topics • options A–E • two questions per page

Topic 1 | Types of Polynomials and Degree

Recognising polynomials and describing a simplified expression by its number of terms and degree • Questions 1–8

Q **1**

Which one of the following is NOT a polynomial?

A) $x^3 - 4x^2 + 2\sqrt{x}$

B) $x^3 - 3x^2 + \sqrt{5}x$

C) $\sqrt{3}x^4 - \sqrt{5}x^2 - 1$

D) $x^2 - 4^{-1}x + \sqrt{12}$

E) $-\frac{1}{3}$

Q **2**

Which one of the following is a polynomial?

A) $5x^4 + x + \sqrt{2}$

B) $\frac{x+3}{3x^2+x+1}$

C) $x^2 + 3x + 2x^{-2}$

D) $\sqrt{x^2 + x + 4}$

E) $2x^2 - x + \sqrt{x}$

Q
3

Which one of the following is NOT a polynomial of degree 2?

A) $x^2 + 2|x| + 1$

B) $(x-2)(x+2)$

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

D) $\pi\, x^2 + ex$

E) $x^2 - 4^{-1}x + \sqrt{5}$

Q
4

When simplified, the expression $8x^3 - 6x^2 - 1 - (2x-1)^3$ is

A) a binomial of degree 2

B) a binomial of degree 1

C) a trinomial of degree 2

D) a monomial of degree 2

E) a monomial of degree 1

Q
5

The expression $\left(x+2+\sqrt{x^2+2}\right)\left(x+2-\sqrt{x^2+2}\right)$ is

A) a binomial of degree 1.

B) a trinomial of degree 2.

C) a binomial of degree 2.

D) a trinomial of degree 4.

E) a binomial of degree 4.

Q
6

The degree of the polynomial $(xy^2-1)^3(2x+1)^2$ is

A) 11

B) 10

C) 9

D) 6

E) 5

Q
7

When simplified, the expression $3y^2\left(3x-\frac{2}{3}\right)\left(x+\frac{2}{9}\right)$ is a

A) binomial of degree 4

B) trinomial of degree 6

C) trinomial of degree 4

D) binomial of degree 2

E) monomial of degree 2

Q
8

When simplified, the expression $(3x-1)^3-27x\left(x^2-x+\frac{1}{3}\right)$ is

A) a monomial of degree 0

B) a binomial of degree 1

C) a binomial of degree 2

D) a trinomial of degree 3

E) a monomial of degree 1

Topic 2 | Coefficients of Polynomials

Finding coefficients and constants in products and powers of polynomials • Questions 9–20

Q **9**

The sum of all the coefficients of the polynomial $(x^2 - 2)^3 - (x^6 + 8)$ is

A) -10

B) -6

C) 22

D) 6

E) 2

Q **10**

The coefficient of xy^2 in the expansion of the expression $x(2x - y)(y + 2x) - (x + y^2)^2$ is:

A) -3

B) 1

C) -2

D) -4

E) 2

Q
11

If the coefficient of xy in the product $(Mx + y)^2\left(x - 1 - \frac{x}{y}\right)$ is -7, then $M =$

A) 3

B) 9

C) $-\frac{7}{2}$

D) $\frac{7}{2}$

E) -3

Q
12

The coefficient of x^2y in the expression $(x^2 - 2y)^2 - (x - y)^3$ is

A) -1

B) 2

C) -2

D) 1

E) -3

Q
13

If A is the leading coefficient and B is the coefficient of x in the polynomial $P(x) = (2x - 3)^3 - (3x - 2)^2$, then $A + B =$

A) 74

B) 82

C) 64

D) 38

E) 56

Q
14

If the coefficient of x^3 in the product $(x^4 + x^3 - kx^2 + x - 5)(3x^2 - 4x + k)$ is 18, then k is equal to:

A) 3

B) -2

C) -5

D) 2

E) 1

Q
15

The sum of the coefficients of x^2y and xy^2 in the expression $(2x - 3y)^3$ is

A) 18

B) -80

C) -18

D) -36

E) 80

Q
16

The coefficient of x^3 in the product $2x(3x - 2)^3$ is equal to

A) -108

B) -54

C) 54

D) 72

E) 27

Q
17

The coefficient of x^2 in the product of $(2x^2 - 3x + 2)(-x^2 + 4x - 3)$ is

A) -20

B) -8

C) -16

D) 8

E) 22

Q
18

The coefficient of x^4 in the expression $(2 - x^2)^3 - (2 + x^2)(2 - x^2)$ is

A) 7

B) 5

C) -7

D) 6

E) 1

Q
19

The coefficient of x in the expression $x(2x-1)(2x+1)-(x-2)^3$ is

A) -11

B) -13

C) 13

D) -12

E) -1

Q
20

If the coefficient of xy in the product $(x-y)(x+y)-(Mx+y)^2$ is 8, then $M=$

A) 4

B) -4

C) -2

D) 8

E) -8

Topic 3 | Expansion and Identities

Expanding and simplifying products, and using algebraic identities • Questions 21–28

Q **21**

The expression $\left(2\sqrt{x}+y\right)\left(2\sqrt{x}-y\right)+(2-y)^2$ simplifies to

A) $4x-4y+4$

B) $4x^2-4y+4$

C) $4x-4y-4$

D) $2y^2+4x-4y+4$

E) $4x+4y+4$

Q **22**

If $x^2+\frac{1}{x^2}=3$, then $\left(x-\frac{1}{x}\right)^2=$

A) 1

B) -1

C) -4

D) 4

E) 9

Q
23

$$\left(1+\frac{x}{y}\right)^2-\left(1-\frac{x}{y}\right)^2=$$

A) $\frac{4x}{y}$

B) $\frac{2x}{y}$

C) $-\frac{4x}{y}$

D) $\frac{x}{y}$

E) $-\frac{x}{y}$

Q
24

The expression $(a^2+b^2)^2-(a^2-b^2)^2$ simplifies to

A) $4a^2b^2$

B) $2a^2b^2$

C) $2a^2$

D) $4a^4b^4$

E) $2a^4b^4$

Q
25

If $x + \frac{1}{x} = 3$, then by using the expansion of $\left(x + \frac{1}{x}\right)^3$, the value of $x^3 + \frac{1}{x^3}$ is equal to

A) 18

B) 27

C) 36

D) 0

E) 3

Q
26

If $(2x + 3)(2x - 3) - (3x - 2)^2 = ax^2 + bx + c$, then $a + b + c =$

A) -10

B) -6

C) 6

D) 10

E) -13

Q
27

If $(A+1)(A^2+1)=3$, then $A^4-1=$

A) 3

B) -3

C) $3A-1$

D) $A-3$

E) $3A-3$

Q
28

If $(k+b)x+2x^2=2(x+k)^2$, then $x=$

A) $\frac{2b^2}{3b+k}$

B) $k-2b$

C) $\frac{2k^2}{b+3k}$

D) $\frac{2k^2}{b-3k}$

E) $\frac{2b^2}{3b-k}$

Answer Key

"Original" shows the question number in the source worksheet.

Q	Original	Ans.	Value
1	8	**A**	$x^3 - 4x^2 + 2\sqrt{x}$
2	12	**A**	$5x^4 + x + \sqrt{2}$
3	28	**A**	$x^2 + 2\lvert x\rvert + 1$
4	6	**A**	a binomial of degree 2
5	10	**A**	a binomial of degree 1.
6	13	**A**	11
7	19	**A**	binomial of degree 4
8	26	**A**	a monomial of degree 0
9	2	**A**	-10
10	4	**A**	-3
11	7	**A**	3
12	11	**A**	-1
13	14	**A**	74
14	15	**A**	3
15	16	**A**	18
16	20	**A**	-108
17	21	**A**	-20
18	23	**A**	7
19	24	**B**	-13
20	27	**B**	-4
21	1	**A**	$4x - 4y + 4$
22	3	**A**	1
23	5	**A**	$\frac{4x}{y}$
24	9	**A**	$4a^2b^2$
25	17	**A**	18
26	22	**B**	-6
27	25	**E**	$3A - 3$
28	29	**D**	$\frac{2k^2}{b - 3k}$