

Algebraic Expressions

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

- A) $4x - 4y + 4$
- B) $4x^2 - 4y + 4$
- C) $4x - 4y - 4$
- D) $2y^2 + 4x - 4y + 4$
- E) $4x + 4y + 4$

2) 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

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

- A) 1
- B) - 1
- C) - 4
- D) 4
- E) 9

4) 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

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

- A) $\frac{4x}{y}$
- B) $\frac{2x}{y}$
- C) $-\frac{4x}{y}$
- D) $\frac{x}{y}$
- E) $-\frac{x}{y}$

6) 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

7) 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

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

9) 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) $2a^4b^4$

10) The expression $(x + 2 + \sqrt{x^2 + 2})(x + 2 - \sqrt{x^2 + 2})$, 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 .

11) 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

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

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

- (a) 11
- (b) 10
- (c) 9
- (d) 6
- (e) 5

14) 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

15) 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

16) 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

17) 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

18) Which one of the following is a polynomial ?

- (f) $5x^4 + x + \sqrt{2}$
- (g) $\frac{x+3}{3x^2+x+1}$
- (h) $x^2 + 3x + 2x^{-2}$
- (i) $\sqrt{x^2+x+4}$
- (j) $2x^2 - x + \sqrt{x}$

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

- (f) 11
- (g) 10
- (h) 9
- (i) 6
- (j) 5

20) 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 $A+B =$

- (f) 74
- (g) 82
- (h) 64
- (i) 38
- (j) 56

21) 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:

- (f) 3
- (g) -2
- (h) -5
- (i) 2
- (j) 1

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

- (f) 18
- (g) -80
- (h) -18
- (i) -36
- (j) 80

23) 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

- (f) 18
- (g) 27
- (h) 36
- (i) 0
- (j) 3

24) 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

25) 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

26) 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