

Algebraic Expressions

Worksheet -1

1. Add:

a) $(10x^2 + 5x - 3)$ and $(7x^2 - 2x + 7)$

b) $(3x^2y + 4x^2y^2 - 7xy^2)$ and $(9x^2y - x^2y^2 + 3xy^2)$

c) $(10x^2y - 3xy^2 + 5x^2y^2 + 22)$ and $(3x^2y^2 + 7)$

2. Subtract $2x^2 + 5x - 7$ from $7x^2 - 5x + 3$.

3. Subtract $2ab + 7a^2 + 8b^2$ from $10b^2 + 7ab + a^2$.

4. Add the following:

a) $3a^2 + 4ab - b^2$, $7b^2 - 4ab + 2a^2$, $a^2 + b^2$

b) $5xy - 7x^2 - 3y^2 + 4x^2y$, $5x^2y - xy + x^2 + y^2$

c) $5a^3 - 2b^3 + 3a^2b + 7ab^2$, $3a^2b - 5ab^2$, $a^3 + b^3 - a^2b$

5. **Subtract $3x^2 - 4y^2$ from the sum of $x^2 + y^2 - 2xy$ and $3x^2 - 4xy + 7y^2$.**

6. **Subtract $4a^3 - 3a^2b + ab^2 - b^3$ from $a^3 + b^3 - 3a^2b + 7ab^2$.**

7. **Add $x^3 - 5x^2 + 7x + 2$, $15x^2 + 10x - 7$ and $x^3 - 13x + 2$.**

8. **Add $3x^2y + 4x^3y - xy^2 + x^2y^2$, $11x^2y - x^3y + 5x^2y^2$ and $5x^3y - x^2y^2 + 7x^2y - 3xy^2$.**

9. **Subtract $5a^3 - 2a^2 + 7$ from the sum of $a^3 - 3a^2 + 5a + 1$ and $7a^2 + a + 3$.**

10. **What should be added to $x^4 + 2x^2 - 7$ to obtain $4x^4 - 3x^3 + x^2 + 2$?**

11. **What must be subtracted from $4x^2y^2 + 3xy + 3xy^2$ to obtain $8xy^2 - 4x^2y + 7x^2y^2 + 10xy$?**

12. Find the products of following expressions.

a) $(3x^2y) \times \left(\frac{-1}{5}xyz\right) \left(\frac{3}{5}y^2z\right)$

b) $\left(\frac{1}{8}ab\right) \times \left(\frac{-8}{11}bc\right) \times \left(\frac{-22}{3}ca\right)$

$$\left(\frac{3}{8}x^2y\right) \times \left(\frac{-4}{7}y^2z\right) \times \left(\frac{-7}{11}z^2x\right)$$

c)

d) $\left(\frac{1}{5}ab\right) \times \left(\frac{-3}{5}a^2b\right) \times \left(\frac{5}{22}b^2c\right)$

13. Find the volume of the box whose dimensions are $3xy^2$, $\frac{1}{7}x^3$ and $\frac{4}{5}x^2y$.

14. Find the area of a field whose length is $3x^2y + y^2$ and breadth is $\frac{5}{8}x^2$.

15. Find the products of the following expressions.

1. $(2x - 1)(x + 2) =$

2. $(p^2 + q^2)(p + q) =$

3. $\left(\frac{2}{3}x + y\right)(x^2 - y^2) =$

4. $(2x - 1)(x^2 + x + 1) =$

5. $(3a + 1)\left(\frac{a^3}{5} - a + 1\right) =$

6. $(x + xy)\left(\frac{x^2}{2} + xy + y^2\right) =$

16. Find the squares of the following binomials.

a) $(2x + 5)$

b) $(3x - 5)$

c) $\left(x - \frac{1}{x}\right)$

17. Find the value of $x^2 + \frac{1}{x^2}$ if $x + \frac{1}{x} = 3$.

18. Find the value of $x^2 + \frac{1}{x^2}$ if $x - \frac{1}{x} = 4$.

19. If $x + y = 4$ and $xy = 3$, find the value of $x^2 + y^2$.

20. If $x^2 + \frac{1}{x^2} = 9$, find the value of $x^4 + \frac{1}{x^4}$.

21. Evaluate using suitable identities.

a) $(196)^2 =$

b) $52 \times 48 =$

c) $(205)^2 =$

d) $(108)^2 =$

22. Find the product.

a) $(x + 2)(3x + 1)(x - 3) =$

b) $(5x + 1)(2x - 3)(x + 5) =$

c) $(2x + y)(x - y)(x + y) =$

d) $(3a + b)(2a + b)(a - b) =$

23. Use suitable identities to get each of the following products.

a) $(p - 11)(p + 11)$

b) $(2y + 5)(2y - 5)$

c) $(12a - 9)(12a + 9)$

d) $(2a - 1/2)(2a + 1/2)$

e) $(1.1m - 0.4)(1.1m + 0.4)$

g) $(6x - 7)(6x + 7)$

i) $[(p/8)+(3q/4)][(p/8)+(3q/4)]$

k) $2(a - 9)^2$

m) $(6x + 5y)^2$

o) $(x - 0.5y)^2$

f) $(a^2 + b^2)(-a^2 + b^2)$

h) $(-a/2 + c/2)(-a/2 + c/2)$

j) $(3a + 9b)(3a - 9b)$

l) $5(xy - 3z)^2$

n) $36[(3p/2) + (2q/3)]^2$

p) $(2xy - 5y)^2$