

ASSIGNMENT OF CLASS 9

MATHEMATICS

Algebra

Learn the identities -

(i) $(a+b)^2 = a^2 + 2ab + b^2$

(ii) $(a-b)^2 = a^2 - 2ab + b^2$

(iii) $(a+b)(a-b) = a^2 - b^2$

1. By multiplication show that - i) $(a+b)(a+b) = a^2 + 2ab + b^2$

ii) $(a-b)(a-b) = a^2 - 2ab + b^2$

iii) $(a+b)(a-b) = a^2 - b^2$

2. Using suitable identities expand the following :-

i) $(x+2y)^2$

ii) $(2x+y)^2$

iii) $(2x-3y)^2$

iv) $(3x-4y)^2$

v) $(2x+3y)(2x-3y)$

vi) $(3x+4y)(3x-4y)$

Solution 1: - $(x + 2y)^2 = x^2 + 2x(2y) + (2y)^2 = x^2 + 4xy + 4y^2$

3. Using suitable identities evaluate the following :-

i) 101^2

ii) 102^2

iii) 99^2

iv) 98^2

v) 101×99

vi) 102×98

vii) 103^2

viii) 96^2

ix) 103×97

Solution 1:

$$\begin{aligned} 101^2 &= (100 + 1)^2 = (100)^2 + 2 \times 100 \times 1 + (1)^2 = 10000 + 200 + 1 \\ &= 10201 \end{aligned}$$

4. Using suitable identities evaluate the following :-

i) 10.1^2

ii) 10.2^2

iii) 9.9^2

iv) 9.8^2

v) 1.01×9.9

vi) 1.02×9.8

vii) 10.3^2

8) 9.6^2

ix) 1.0302×9.7

Solution 1:

$$(10 + 0.1)^2 = (10)^2 + 2 \times 10 \times 0.1 + (0.1)^2 = 100 + 2 + 0.01 = 102.01$$

5. Show that: -

i) $(a+b)^2 - 4ab = (a-b)^2$

ii) $(x+2y)^2 - 8xy = (x-2y)^2$

iii) $(2x+3y)^2 - 24xy = (2x-3y)^2$

Solution 1: - $(a+b)^2 - 4ab = a^2 + 2ab + b^2 - 4ab = a^2 + 2ab + b^2 = (a+b)^2$

6 Add: $7xy + 5yz - 3zx, 4yz + 9zx - 4y, -3xz + 5x - 2xy.$

Solution :- $(7xy + 5yz - 3zx) + (4yz + 9zx - 4y) + (-3xz + 5x - 2xy)$

$$= 7xy + 5yz - 3zx + 4yz + 9zx - 4y - 3xz + 5x - 2xy$$

$$= 7xy - 2xy + 5yz + 4yz - 3zx + 9zx - 3zx + 5x - 4y = 5xy + 9yz + 3zx + 5x - 4y$$

7 Q Subtract $5x^2 - 4y^2 + 6y - 3$ from $7x^2 - 4xy + 8y^2 + 5x - 3y.$

Solution: - $7x^2 - 4xy + 8y^2 + 5x - 3y - (5x^2 - 4y^2 + 6y - 3)$
 $= 7x^2 - 4xy + 8y^2 + 5x - 3y - 5x^2 + 4y^2 - 6y + 3$
 $= 7x^2 - 5x^2 - 4xy + 8y^2 + 4y^2 + 5x - 3y - 6y + 3$
 $= 2x^2 - 4xy + 12y^2 + 5x - 9y + 3$

8 Si Simplify the expression and evaluate them as directed

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

(b) $3y(2y-7) - 3(y-4) - 63$ for $y = -2$

Solution (b):

$$3y(2y-7) - 3(y-4) - 63 = 6y^2 - 21y - 3y + 12 = 6y^2 - 24y + 12$$

Put $y = -2, 6y^2 - 24y + 12 = 6(-2)^2 - 24 \times (-2) + 12 = 6 \times 4 + 48 + 12 = 84$

9 Find- (i) $5m(3-m)$ and $6m^2 - 13m$

(ii) $4y(3y^2 + 5y - 7)$ and $2(y^3 - 4y^2 + 5)$

10 Subtract $3pq(p-q)$ from $2pq(p+q).$

11 Multiply

(i) $(x-4)$ and $(2x+3)$

(ii) $(x-y)$ and $(3x+5y)$

12 Multiply

(i) $(a+7)$ and $(b-5)$

(b) $(a^2 + 2b^2)$ and $(5a-3b)$

13 Simplify $(a+b)(2a-3b+c) - (2a-3c)c$

14 find-

$$(i) \left[\frac{3}{2}m + \frac{2}{3}n \right] \left[\frac{3}{2}m - \frac{2}{3}n \right] \quad (ii) 983^2 - 17^2 \quad (iii) 194 \times 206$$

15 Subtract $4a - 7ab + 3b + 12$ from $12a - 9ab + 5b - 3$

16 Subtract $3xy + 5yz - 7zx$ from $5xy - 2yz - 2zx + 10xyz$

17 4P Subtract $P^2q - 3pq + 5pq^2 - 8p + 7q - 10$ from $18 - 3p - 11q + 5pq - 2pq^2 + 5p^2q$

18 Simplify $3x(4x-5) + 3$ and find its values for (i) $x=3$ (ii) $x=\frac{1}{2}$

19 Simplify $a(a^2 + a + 1) + 5$ and find its values for (i) $a=0$ (ii) $a=1$

20 Add $p(p-q)$, $q(q-r)$ and $r(r-p)$

21 Add $2x(z-x-y)$ and $2y(z-y-x)$

22 Subtract $3l(l - 4m + 5n)$ from $4l(10n - 3m + 2l)$

23 Subtract $3a(a+b+c) - 2b(a-b+c)$ from $4c(-a+b+c)$

24 Using $a^2 - b^2 = (a+b)(a-b)$, find:

$$(i) 51^2 - 49^2 \quad (ii) (1.02)^2 - (0.98)^2 \quad (iii) 153^2 - 147^2 \quad (iv) 12.1^2 - 7.9^2$$

25 Using $(x+a)(x-b) = x^2 + (a+b)x + ab$ find:

$$(i) 103 \times 104 \quad (ii) 5.1 \times 5.2$$

$$(iii) 103 \times 98 \quad (iv) 9.7 \times 9.8$$

26 Using identities, evaluate

$$(i) 71^2 \quad (ii) 99^2 \quad (iii) 102^2$$

$$(iv) 998^2 \quad (v) 5.2^2 \quad (vi) 297 \times 303$$

$$(vii) 78 \times 82 \quad (viii) 8.9^2 \quad (ix) 1.05 \times 9.5$$

Show that :-

$$(1) (a-1)(b-c) + (b-1)(c-a) + (c-1)(a-b) = 0$$

$$(2) (p-1)(q-r) + (q-1)(r-p) + (r-1)(p-q) = 0$$

$$(3) (x-1)(y-z) + (y-1)(z-x) + (z-1)(x-y) = 0$$

Factorisation and Algebraic Identities

Q (I) Factorize using suitable identities:

$$i) (x^2 + 4x + 4) - (y^2 - 6y + 9)$$

$$ii) (x^2 + 6x + 9) - (y^2 - 8y + 16)$$

$$iii) (x^2 - 8x + 16) - (y^2 + 10y + 25)$$

$$iv) (x^2 + 10x + 25) - (y^2 - 12y + 36)$$

$$v) 9x^2 + 6xy + y^2$$

vi) $4y^2 - 4y + 1$

vii) $x^2 - \frac{y^2}{100}$

Solution 1: - $(x^2 + 4x + 4) - (y^2 - 6y + 9)$

$$= (x^2 + 2 \times x \times 2 + 2^2) - (y^2 - 2 \times y \times 3 + 3^2)$$

$$= (x + 2)^2 - (y - 3)^2$$

$$= \{(x + 2) + (y - 3)\}\{(x + 2) - (y - 3)\}$$

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

Q (2) Simplify:

i) $(x^2 - 5x + 6) \div (x - 2)$

ii) $(x^2 - 9x + 20) \div (x - 4)$

iii) $(x^2 + 8x + 15) \div (x + 5)$

iv) $(x^2 + 6x + 5) \div (x + 1)$

v) $(x^2 - 5x + 6) \div (x - 3)$

vi) $(x^2 - 9x + 20) \div (x - 5)$

viii) $(x^2 - 6x + 5) \div (x - 5)$

Solution 1: - $(x^2 - 5x + 6) \div (x - 2) = \{x^2 - (3 + 2)x + 6\} \div (x - 2)$

$$= \{x^2 - 3x - 2x + 6\} \div (x - 2)$$

$$= \{x(x - 3) - 2(x - 3)\} \div (x - 2)$$

$$= (x - 3)(x - 2) \div (x - 2) = x -$$

3

Q (3) Factorize by middle term splitting method :-

i) $2x^2 + 5x + 3$

ii) $2x^2 + 7x + 5$

iii) $6x^2 + 7x + 2$

iv) $5x^2 - 7x + 2$

v) $2x^2 - 9x + 7$

vi) $3x^2 - 7x + 4$

vii) $2x^2 + 5x - 7$

viii) $3x^2 + 2x - 8$

ix) $5x^2 + 2x - 3$

x) $3x^2 - 2x - 5$

xi) $5x^2 - 8x - 4$

xii) $3x^2 - 7x - 10$

xiii) $5x^2 - 7x - 6$

xiv) $2x^2 + 7x - 15$

xv) $3x^2 - 8x + 4$

xvi) $3x^2 - 8x + 4$

xvii) $3x^2 - 10x + 7 = 0$

xviii) $3x^2 - x - 4$

xix) $6x^2 - 7x - 3$

xx) $4x^2 - 4x + 1$

xxi) $x^2 - 2x - 8$

Q (4) Using suitable identities find the value of the following:

- | | | | |
|-----------------------|-----------------------|----------------------|-----------------------|
| i) 103×102 | ii) 103×104 | iii) 96×97 | iv) 98×91 |
| v) 103×98 | vi) 102×97 | vii) 101×98 | viii) 102×99 |
| ix) 102×98 | x) 103×97 | xi) 104×96 | xii) 108×98 |
| xiii) 101×99 | xiv) 103×107 | xv) 95×96 | xvi) 104×96 |

$$Solution\ 1:- 103 \times 102 = (100 + 3) \times (100 + 2)$$

$$= (100)^2 + (3 + 2) \times 100 + 3 \times 2$$

{By using the identity $(x + a)(x + b) = x^2 + (a + b)x + ab$ }

$$= 10000 + 5 \times 100 + 6 = 10000 + 500$$

DATE	Assignment	Content	Book
23/3/19 TO 30/3/19	EXERCISE -1.1,1.2,1.3,1.4,1.5 EXERCISE-2.1	NUMBER SYSTEM AND REAL NUMBERS	R D SHARMA
20/4/19 TO 24/4/19	EXERCISE-3.1,3.2	RATIONALISATION	R D SHARMA