

# CLASS NOTES

Class: VIII

Topic: Ch.9 Algebraic Expressions and Identities

Subject: Mathematics

## EXERCISE 9.5

**Q1. Use a suitable identity to get each of the following products**

(ii)  $(2y+5)(2y+5) = (2y+5)^2$   
 $= (2y)^2 + 2 \times 2y \times 5 + (5)^2$

**Using identity:**

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

$$= 4y^2 + 20y + 25$$

(iv)  $\left(3a - \frac{1}{2}\right)\left(3a - \frac{1}{2}\right) = \left(3a - \frac{1}{2}\right)^2$   
 $= (3a)^2 - 2 \times 3a \times \frac{1}{2} + \left(\frac{1}{2}\right)^2$   
 $= 9a^2 - 3a + \frac{1}{4}$

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

**[Using identity**

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

$$= 1.21m^2 - 0.16$$

(vi)  $(a^2 + b^2)(-a^2 + b^2) = (b^2 + a^2)(b^2 - a^2)$   
 $= (b^2)^2 - (a^2)^2$   
**[Using identity  $(a-b)(a+b) = a^2 - b^2$ ]**  
 $= b^4 - a^4$

(viii)  $(-a+c)(-a+c)$

$$= (c-a)(c-a) = (c-a)^2$$

$$= (c)^2 - 2 \times c \times a + (a)^2$$

**Using identity:**  $(a-b)^2 = a^2 - 2ab + b^2$

$$= c^2 - 2ca + a^2$$

(ix)  $\left(\frac{x}{2} + \frac{3y}{4}\right)\left(\frac{x}{2} + \frac{3y}{4}\right) = \left(\frac{x}{2} + \frac{3y}{4}\right)^2$   
 $= \left(\frac{x}{2}\right)^2 + 2 \times \frac{x}{2} \times \frac{3y}{4} + \left(\frac{3y}{4}\right)^2$   
 $= \frac{x^2}{4} + \frac{3}{4}xy + \frac{9}{16}y^2$

**Q2. Use the identity  $(x+a)(x+b) = x^2 + (a+b)x + ab$  to find the following products:**

(ii)  $(4x-5)(4x-1)$

$$= (4x)^2 + (5+1)4x + 5 \times 1$$

**Using identity:**

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

$$= 16x^2 + 6 \times 4x + 5 = 16x^2 + 24x + 5$$

(iii)  $(4x-5)(4x-1)$

$$(4x)^2 + (-5-1)4x + (-5) \times (-1)$$

$$16x^2 + (-6) \times 4x + 5 = 16x^2 - 24x + 5$$

$$\begin{aligned}
 & \text{(iv)} \quad (4x+5)(4x-1) \\
 & = (4x)^2 + \{5 \times (-1)\} \times 4x + 5 \times (-1) \\
 & = 16x^2 + (5-1) \times 4x - 5 \\
 & = 16x^2 + 4 \times 4x - 5 \\
 & = 16x^2 + 16x - 5
 \end{aligned}$$

$$\begin{aligned}
 & \text{(v)} \quad (2a^2+9)(2a^2+5) \\
 & = (2a^2)^2 + (9+5) \times 2a^2 + 9 \times 5 \\
 & = 4a^4 + 14 \times 2a^2 + 45 \\
 & = 4a^4 + 28a^2 + 45
 \end{aligned}$$

**Q3. Find the following squares by using identities:**

$$\begin{aligned}
 & \text{(iii)} \quad (6x^2-5y)^2 \\
 & = (6x^2)^2 - 2 \times 6x^2 \times 5y + (5y)^2 \\
 & = (6x^2)^2 - 2 \times 6x^2 \times 5y + (5y)^2 \\
 & = 36x^4 - 60x^2y + 25y^2
 \end{aligned}$$

$$\begin{aligned}
 & \text{(v)} \quad (0.4p-0.5q)^2 \\
 & = (0.4p)^2 - 2 \times 0.4p \times 0.5q + (0.5q)^2 \\
 & = 0.16p^2 - 0.40pq + 0.25q^2
 \end{aligned}$$

**4. Simplify:**

$$\begin{aligned}
 & \text{(i)} \quad (a^2-b^2)^2 \\
 & = (a^2)^2 - 2 \times a^2 \times b^2 + (b^2)^2
 \end{aligned}$$

**Using identities:**

$$\begin{aligned}
 & (a-b)^2 = a^2 - 2ab + b^2 \\
 & = a^4 - 2a^2b^2 + b^4
 \end{aligned}$$

$$\begin{aligned}
 & \text{(ii)} \quad (2x+5)^2 - (2x-5)^2 \\
 & = (2x)^2 + 2 \times 2x \times 5 + (5)^2 \\
 & \quad - [(2x)^2 - 2 \times 2x \times 5 + (5)^2] \\
 & = 4x^2 + 20x + 25 - [4x^2 - 20x + 25] \\
 & = 4x^2 + 20x + 25 - 4x^2 + 20x - 25 \\
 & = 40x
 \end{aligned}$$

$$\begin{aligned}
 & \text{(vii)} \quad (m^2-n^2m)^2 + 2m^3n^2 \\
 & = (m^2)^2 - 2 \times m^2 \times n^2m + (n^2m)^2 + 2m^3n^2 \\
 & = m^4 - 2m^3n^2 + n^4m^2 + 2m^3n^2 \\
 & = m^4 + n^4m^2
 \end{aligned}$$

$$\begin{aligned}
 & \text{(vi)} \\
 & (ab+bc)^2 - 2ab^2c = (ab)^2 + 2 \times ab \times bc + (bc)^2 - 2ab^2c \\
 & = a^2b^2 + 2ab^2c + b^2c^2 - 2ab^2c \\
 & = a^2b^2 + b^2c^2
 \end{aligned}$$

**Assignment:** Write the content in your note book Also solve the remaining parts of Qs.1, 2, 3 & 4.

**THIS CONTENT IS PREPARED ABSOLUTELY FROM HOME.**