

## VIII Test - 15 Algebraic Expressions

1) Find the products using identity :-

(i)  $(4x + 5y)(4x - 5y)$

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

2) Expand using identity :-

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

(ii)  $\left(\frac{3}{4}p - \frac{5}{6}q\right)^2$

3) Evaluate using identity :-

(i)  $(999)^2$

(ii)  $8.3 \times 7.7$

4) Find the product using identity :-

(i)  $(2x + 5y)^2$

(ii)  $\left(\frac{2a}{3} + \frac{3b}{4}\right)^2$

5) Divide :-

(i)  $6x^5 + 18x^4 - 3x^2$  by  $3x^2$

(ii)  $20x^3y + 12x^2y^2 - 10xy$  by  $2xy$

6) Multiply :  $(9x^2 - x + 15)(x^2 - 3)$

7) Add :-  $4x^2 - 7xy + 4y^2 - 3$  ;  $5 + 6y^2 - 8xy + x^2$  ;  $6 - 2xy + 2x^2 - 5y^2$

8) The perimeter of a  $\Delta$  is  $6p^2 - 4p + 9$  and two of its sides are  $p^2 - 2p + 1$  and  $3p^2 - 5p + 3$ . Find the third side of the triangle.

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1) (i)  $(4x+5y)(4x-5y) = 16x^2 - 25y^2$  [ $\because (a+b)(a-b) = a^2 - b^2$ ]

(ii)  $(3x^2+2y^2)(3x^2-2y^2) = (3x^2)^2 - (2y^2)^2$   
 $= 9x^4 - 4y^4$  [ $\because (a+b)(a-b) = a^2 - b^2$ ]

2) (i)  $(3x-2y)^2$   
 $[a-b]^2 = a^2 - 2ab + b^2$   
 $= (3x)^2 - 2 \times 3x \times 2y + (2y)^2$   
 $= 9x^2 - 12xy + 4y^2$

(ii)  $(\frac{3}{4}p - \frac{5}{6}q)^2$   
 $[a-b]^2 = a^2 - 2ab + b^2$   
 $= (\frac{3}{4}p)^2 - 2 \times \frac{3}{4}p \times \frac{5}{6}q + (\frac{5}{6}q)^2$   
 $= \frac{9p^2}{16} - \frac{5}{4}pq + \frac{25}{36}q^2$

3) (i)  $(999)^2 = (1000-1)^2$   
 $[a-b]^2 = a^2 - 2ab + b^2$   
 $= (1000)^2 - 2 \times 1000 \times 1 + (1)^2$   
 $= 10000 - 2000 + 1 = 98001$

(ii)  $8.3 \times 7.7 = (8+0.3)(8-0.3)$   
 $[a+b](a-b) = a^2 - b^2$   
 $= (8)^2 - (0.3)^2 = 64 - 0.09 = 63.91$

4) (i)  $(2x+5y)^2$   
 $[a+b]^2 = a^2 + 2ab + b^2$   
 $= (2x)^2 + 2 \times 2x \times 5y + (5y)^2$   
 $= 4x^2 + 20xy + 25y^2$

(ii)  $(\frac{2}{3}a + \frac{3}{4}b)^2$  [ $[a+b]^2 = a^2 + 2ab + b^2$ ]  
 $= (\frac{2}{3}a)^2 + 2 \times \frac{2}{3}a \times \frac{3}{4}b + (\frac{3}{4}b)^2 = \frac{4}{9}a^2 + ab + \frac{9}{16}b^2$

$$5) (i) \frac{6x^5 + 18x^4 - 3x^2}{3x^2} = \frac{6x^5}{3x^2} + \frac{18x^4}{3x^2} - \frac{3x^2}{3x^2}$$

$$= 2x^3 + 6x^2 - 1$$

$$(ii) \frac{20x^3y + 12x^2y^2 - 10xy}{2xy} = \frac{20x^3y}{2xy} + \frac{12x^2y^2}{2xy} - \frac{10xy}{2xy}$$

$$= 10x^2 + 6xy - 5$$

$$6) (9x^2 - x + 15)(x^2 - 3)$$

$$= 9x^4 - 27x^2 - x^3 + 3x + 15x^2 - 45$$

$$= 9x^4 - 12x^2 - x^3 + 3x - 45$$

$$7) \begin{array}{r} 4x^2 - 7xy + 4y^2 - 3 \\ + x^2 - 8xy + 6y^2 + 5 \\ \hline 2x^2 - 22xy - 5y^2 + 6 \\ \hline 7x^2 - 17xy + 5y^2 + 8 \end{array}$$

$$8) \text{Perimeter} = 6p^2 - 4p + 9$$

$$\text{Sum of two sides} = p^2 - 2p + 1 + 3p^2 - 5p + 3$$

$$= 4p^2 - 7p + 4$$

$$\therefore \text{The third side} = \text{Perimeter} - \text{Sum of two sides}$$

$$= 6p^2 - 4p + 9 - 4p^2 + 7p - 4$$

$$= 2p^2 + 3p + 5$$