

<b>Name:</b>	<b>Std: IX</b>	<b>Date:</b>
<b>Subject: Mathematics</b>	<b>Roll No:</b>	
<b>Topic: Polynomials</b>		

**1. Expand each of the following**

(a)  $(3x + 4y)^2$

(b)  $\left(\frac{x}{2} - \frac{y}{3}\right)^2$

(c)  $\left(\frac{5a}{4} + \frac{7b}{3}\right)^2$

**2. Find the products by using suitable identities**

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

(b)  $\left(x - \frac{1}{x}\right)\left(x + \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2}\right)\left(x^4 + \frac{1}{x^4}\right)$

(c)  $\left(\frac{a}{7} - \frac{b}{4}\right)\left(\frac{b}{4} + \frac{a}{7}\right)$

**3. Evaluate each of the following by using identities**

(a)  $107 \times 93$

(b)  $107 \times 107$

(c)  $122 \times 122$

(d)  $185 \times 185 - 115 \times 115$

(e)  $(105)^3$

(f)  $(85)^3$

(g)  $(997)^3$

(h)  $(1002)^3$

**4. Write the following in expanded form**

(a)  $(9x + 2y + z)^2$

(b)  $(3x + 2y - z)^2$

(c)  $(-x + 2y + z)^2$

(d)  $(2x + 3y)^3$

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

(f)  $\left(\frac{x}{4}-\frac{y}{3}\right)^3$

(g)  $\left(m+\frac{n}{5}\right)^3$

**5. Factorize the following**

a)  $2x^2+7x+3$

b)  $2y^3-4y^2-2y+4$

c)  $x^3-125$

d)  $x^2+9y^2-25m^2-16n^2+16xy+40mn$

**6. Evaluate**

(a)  $48^3-30^3-18^3$

(b)  $\left(\frac{1}{2}\right)^3+\left(\frac{1}{3}\right)^3-\left(\frac{5}{6}\right)^3$

(c)  $(0.2)^3-(0.3)^3+(0.1)^3$

**7. Show that**

(a)  $(3x+7)^2-84x=(3x-7)^2$

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

**8. Solve the following:**

(a) If  $x+y=12$  and  $xy=27$ , find the value of  $x^3+y^3$

(b) If  $x-y=6$  and  $xy=20$ , find the value of  $x^3-y^3$

(c) If  $x+y+z=15$  and  $x^2+y^2+z^2=75$ , find  $xy+yz+zx$

**ANSWER KEY**

1. (a)  $(9x^2 + 24xy + 16y^2)$  (b)  $\left(\frac{x^2}{4} - \frac{xy}{3} + \frac{y^2}{9}\right)$  (c)  $\left(\frac{25a^2}{16} + \frac{70ab}{3} + \frac{49b^2}{9}\right)$

2. (a)  $(4x^2 - 9y^2)$

(b)  $\left(x^8 - \frac{1}{x^8}\right)$

(c)  $\left(\frac{a^2}{49} - \frac{b^2}{4}\right)$

3. (a) 9951

(b) 11449

(c) 14884

(d) 21000

(e) 1157625

(f) 614125

(g) 99102673

(h) 1006012008

4. (a)  $(81x^2 + 4y^2 + z^2 + 36xy + 4yz + 18xz)$

(b)  $(9x^2 + 4y^2 + z^2 + 12xy - 4yz - 6xz)$

(c)  $(x^2 + 4y^2 + z^2 - 4xy + 4yz - 2xz)$

(d)  $(8x^3 + 27y^3 + 36x^2y + 54xy^2)$

(e)  $(27x^3 - 8y^3 - 54x^2y + 36xy^2)$

(f)  $\left(\frac{x^3}{64} - \frac{y^3}{27} - \frac{x^2y}{16} + \frac{xy^2}{12}\right)$

(g)  $\left(m^3 - \frac{n^3}{125} - \frac{m^2n}{5} + \frac{mn^2}{25}\right)$

5. (a)  $(x+3)(2x+1)$

(b)  $(y-1)(y+1)(2y-4)$

(c)  $(x-5)(x^2+5x+25)$

(d)  $(x+3y+5m-4n)(x+3y-5m+4n)$

6. (a) (77760)

(b)  $\left(\frac{-5}{12}\right)$

(c) (-.018)

7. Proving

8. a) 3707 b) 576 c) 75