



Class 9 Maths – Ganita Manjari



Chapter 4 – Exploring Algebraic Identities



Exercise Set 4.2 – Solutions

Exercise Set 4.2 contains **2 questions**: factorisation using identities and finding squares using $(a - b)^2$.



Identities Used



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



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



Q1. Factor completely

(i) $9x^2 + 24xy + 16y^2$

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

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



Answer: $(3x + 4y)^2$

(ii) $4s^2 + 20st + 25t^2$

$$= (2s)^2 + 2(2s)(5t) + (5t)^2$$

$$= (2s + 5t)^2$$



Answer: $(2s + 5t)^2$

(iii) $49x^2 + 28xy + 4y^2$

$$= (7x)^2 + 2(7x)(2y) + (2y)^2$$

$$= (7x + 2y)^2$$

✓ Answer: $(7x + 2y)^2$

(iv) $64p^2 + (32/3)pq + (4/9)q^2$

$$= (8p)^2 + 2(8p)(2q/3) + (2q/3)^2$$

$$= (8p + 2q/3)^2$$

✓ Answer: $(8p + 2q/3)^2$

(v) $3a^2 + 4ab + (4/3)b^2$

Take $1/3$ common:

$$= 1/3(9a^2 + 12ab + 4b^2)$$

$$= 1/3[(3a)^2 + 2(3a)(2b) + (2b)^2]$$

$$= 1/3(3a + 2b)^2$$

✓ Answer: $1/3(3a + 2b)^2$

(vi) $(9/5)s^2 + 6sv + 5v^2$

Take $1/5$ common:

$$= 1/5(9s^2 + 30sv + 25v^2)$$

$$= 1/5[(3s)^2 + 2(3s)(5v) + (5v)^2]$$

$$= 1/5(3s + 5v)^2$$

✓ Answer: $1/5(3s + 5v)^2$

The textbook specifically hints at taking a common factor in parts (v) and (vi).

Q2. Find the values using $(a - b)^2$

(i) 79^2

$$79 = 80 - 1$$

$$79^2 = (80 - 1)^2$$

$$= 80^2 - 2(80)(1) + 1^2$$

$$= 6400 - 160 + 1$$

$$= \mathbf{6241}$$

 **Answer: 6241**

(ii) 193^2

$$193 = 200 - 7$$

$$193^2 = (200 - 7)^2$$

$$= 200^2 - 2(200)(7) + 7^2$$

$$= 40000 - 2800 + 49$$

$$= \mathbf{37249}$$

 **Answer: 37249**

(iii) 299^2

$$299 = 300 - 1$$

$$299^2 = (300 - 1)^2$$

$$= 300^2 - 2(300)(1) + 1^2$$

$$= 90000 - 600 + 1$$

$$= \mathbf{89401}$$

✓ Answer: 89401

QUICK ANSWER KEY

Q1. Factor completely

① $(3x + 4y)^2$

② $(2s + 5t)^2$

③ $(7x + 2y)^2$

④ $(8p + 2q/3)^2$

⑤ $1/3(3a + 2b)^2$

⑥ $1/5(3s + 5v)^2$

Q2. Values

① $79^2 = 6241$

② $193^2 = 37249$

③ $299^2 = 89401$