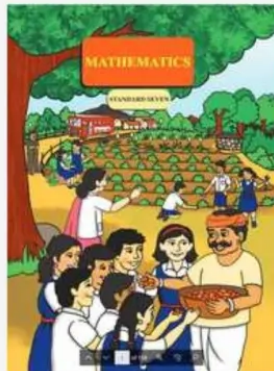


# Maharashtra Board Solutions Class 7-Maths

## (Practice Set 50): Chapter 14- Algebraic Formulae - Expansion of Squares

BOOK SOLUTIONS  
**CLASS 7**  
MATHS

CHAPTER 14  
**Algebraic Formulae -  
Expansion of Squares**



Maharashtra Board Solutions→

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# Maharashtra Board Solutions Class 7-Maths (Practice Set 50): Chapter 14- Algebraic Formulae - Expansion of Squares

Class 7: Maths Chapter 14 solutions. Complete Class 7 Maths Chapter 14 Notes.

## Maharashtra Board Solutions Class 7-Maths (Practice Set 50): Chapter 14- Algebraic Formulae - Expansion of Squares

Maharashtra Board 7th Maths Chapter 14, Class 7 Maths Chapter 14 solutions

### Question 1.

Expand:

i.  $(5a + 6b)^2$

ii.  $(a^2 + b^3)^2$

iii.  $(2p - 3q)^2$

iv.  $(x - 2x)^2$

v.  $(ax + by)^2$

vi.  $(7m - 4)^2$

vii.  $(x + 12)^2$

viii.  $(a - 1a)^2$

**Solution:**

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i.  $(5a + 6b)^2$

Here,  $A = 5a$  and  $B = 6b$

$$(5a + 6b)^2 = (5a)^2 + 2 \times 5a \times 6b + (6b)^2$$

$$\dots [(A + B)^2 = A^2 + 2AB + B^2]$$

$$\therefore (5a + 6b)^2 = 25a^2 + 60ab + 36b^2$$

ii.  $(a^2 + b^3)^2$

Here  $A = a^2$  and  $B = b^3$

$$\left(\frac{a}{2} + \frac{b}{3}\right)^2 = \left(\frac{a}{2}\right)^2 + 2 \times \frac{a}{2} \times \frac{b}{3} + \left(\frac{b}{3}\right)^2$$

$$\dots [(A + B)^2 = A^2 + 2AB + B^2]$$

$$\therefore \left(\frac{a}{2} + \frac{b}{3}\right)^2 = \frac{a^2}{4} + \frac{ab}{3} + \frac{b^2}{9}$$

iii.  $(2p - 3q)^2$

Here,  $a = 2p$  and  $b = 3q$

$$(2p - 3q)^2 = (2p)^2 - 2 \times (2p) \times (3q) + (3q)^2$$

$$\dots [(a - b)^2 = a^2 - 2ab + b^2]$$

$$\therefore (2p - 3q)^2 = 4p^2 - 12pq + 9q^2$$

iv.  $(x - 2x)^2$

Here  $a = x$  and  $b = 2x$

$$\left(x - \frac{2}{x}\right)^2 = x^2 - 2 \times x \times \frac{2}{x} + \left(\frac{2}{x}\right)^2$$
$$\dots [(a - b)^2 = a^2 - 2ab + b^2]$$

$$\therefore \left(x - \frac{2}{x}\right)^2 = x^2 - 4 + \frac{4}{x^2}$$

v.  $(ax + by)^2$

Here,  $A = ax$  and  $B = by$

$$(ax + by)^2 = (ax)^2 + 2 \times ax \times by + (by)^2$$

$$\dots [(A + B)^2 = A^2 + 2AB + B^2]$$

$$\therefore (ax + by)^2 = a^2x^2 + 2abxy + b^2y^2$$

vi.  $(7m - 4)^2$

Here,  $a = 7m$  and  $b = 4$

$$(7m - 4)^2 = (7m)^2 - 2 \times 7m \times 4 + 4^2$$

$$\dots [(a - b)^2 = a^2 - 2ab + b^2]$$

$$\therefore (7m - 4)^2 = 49m^2 - 56m + 16$$

vii.  $(x+12)^2$

Here  $a = x$  and  $b = 12$

$$\left(x + \frac{1}{2}\right)^2 = x^2 + 2 \times x \times \frac{1}{2} + \left(\frac{1}{2}\right)^2$$
$$\dots [(a + b)^2 = a^2 + 2ab + b^2]$$

$$\therefore \left(x + \frac{1}{2}\right)^2 = x^2 + x + \frac{1}{4}$$

viii.  $(a-1a)^2$

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Here  $A = a$  and  $B = 1a$

$$\left(a - \frac{1}{a}\right)^2 = a^2 - 2 \times a \times \frac{1}{a} + \left(\frac{1}{a}\right)^2$$
$$\dots [(A - B)^2 = A^2 - 2AB + B^2]$$
$$\therefore \left(a - \frac{1}{a}\right)^2 = a^2 - 2 + \frac{1}{a^2}$$

**Question 2.**

Which of the options given below is the square of the binomial

- (A)  $64 - 1x^2$
- (B)  $64 + 1x^2$
- (C)  $64 - 16x + 1x^2$
- (D)  $64 + 16x + 1x^2$

**Solution:**

- (C)  $64 - 16x + 1x^2$

Hint:

$$= (8 - 1x)^2 = 8^2 - 2 \times 8 \times 1x + (1x)^2 \dots [(a - b)^2 = a^2 - 2ab + b^2]$$

$$= 64 - 16x + 1x^2$$

**Question 3.**

Of which of the binomials given below is the  $m^2n^2 + 14mnpq + 49p^2q^2$  the expansion?

- (A)  $(m + n)(p + q)$
- (B)  $(mn - pq)$
- (C)  $(7mn + pq)$
- (D)  $(mn + 7pq)$

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**Solution:**

(D)  $(mn + 7pq)$

Hint:

Here, square root of the first term =  $mn$

Square root of the last term =  $7pq$

$\therefore$  Required binomial =  $(mn + 7pq)^2$

**Question 4.**

**Use an expansion formula to find the values of:**

i.  $(997)^2$

ii.  $(102)^2$

iii.  $(97)^2$

iv.  $(1005)^2$

**Solution:**

i.  $(997)^2 = (1000 - 3)^2$

Here,  $a = 1000$  and  $b = 3$

$$(1000 - 3)^2 = (1000)^2 - 2 \times 1000 \times 3 + 3^2$$

$$\dots [(a - b)^2 = a^2 - 2ab + b^2]$$

$$= 1000000 - 6000 + 9$$

$$= 994009$$

$$\therefore (997)^2 = 994009$$

ii.  $(102)^2 = (100 + 2)^2$

Here,  $a = 100$  and  $b = 2$

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

$$\dots [(a + b)^2 = a^2 + 2ab + b^2]$$

$$= 10000 + 400 + 4$$

$$= 10404$$

$$\therefore (102)^2 = 10404$$

$$\text{iii. } (97)^2 = (100 - 3)^2$$

Here,  $a = 100$  and  $b = 3$

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

$$\dots [(a - b)^2 = a^2 - 2ab + b^2]$$

$$= 10000 - 600 + 9$$

$$= 9409$$

$$\therefore (97)^2 = 9409$$

$$\text{iv. } (1005)^2 = (1000 + 5)^2$$

Here,  $a = 1000$  and  $b = 5$   $(1000 + 5)^2$

$$= (1000)^2 + 2 \times 1000 \times 5 + 5^2$$

$$\dots [(a + b)^2 = a^2 + 2ab + b^2]$$

$$= 1000000 + 10000 + 25$$

$$= 1010025$$

$$\therefore (1005)^2 = 1010025$$

### Intext Questions and Activities

#### Question 1.

Use the given values to verify the formulae for squares of binomials. (Textbook pg. no. 92)

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i.  $a = -7, b = 8$

ii.  $a = 11, b = 3$

iii.  $a = 2.5, b = 1.2$

**Solution:**

i.  $(a + b)^2 = (-7 + 8)^2$

$$= 1^2$$

$$= 1$$

$$a^2 + 2ab + b^2 = (-7)^2 + 2 \times (-7) \times 8 + 8^2$$

$$= 49 - 112 + 64$$

$$= 1$$

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

$$(a - b)^2 = (-7 - 8)^2$$

$$= (-15)^2$$

$$= 225$$

$$a^2 - 2ab + b^2 = (-7)^2 - 2 \times (-7) \times 8 + (8)^2$$

$$= 49 + 112 + 64$$

$$= 225$$

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

ii.  $(a + b)^2 = (11 + 3)^2$

$$= 14^2$$

$$= 196$$

$$a^2 + 2ab + b^2 = 11^2 + 2 \times 11 \times 3 + 3^2$$

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$$= 121 + 66 + 9$$

$$= 196$$

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

$$(a - b)^2 = (11 - 3)^2 = 8^2$$

$$= 64$$

$$a^2 - 2ab + b^2 = 11^2 - 2 \times 11 \times 3 + 3^2$$

$$= 121 - 66 + 9$$

$$= 64$$

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

$$\text{iii. } (a + b)^2 = (2.5 + 1.2)^2$$

$$= 3.7^2$$

$$= 13.69$$

$$a^2 + 2ab + b^2 = (2.5)^2 + 2 \times 2.5 \times 1.2 + (1.2)^2$$

$$= 6.25 + 6 + 1.44$$

$$= 13.69$$

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

$$(a - b)^2 = (2.5 - 1.2)^2$$

$$= 1.32$$

$$= 1.69$$

$$a^2 - 2ab + b^2 = (2.5)^2 - 2 \times 2.5 \times 1.2 + (1.2)^2$$

$$= 6.25 - 6 + 1.44$$

$$= 1.69$$

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



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- Chapter 3- HCF and LCM (Practice Set 11)
- Chapter 3- HCF and LCM (Practice Set 12)
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- Chapter 3- HCF and LCM (Practice Set 14)
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- Chapter 4- Angles and Pairs of Angles (Practice Set 16)
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- Chapter 5- Operations on Rational Numbers (Practice Set 22)
- Chapter 5- Operations on Rational Numbers (Practice Set 23)
- Chapter 5- Operations on Rational Numbers (Practice Set 24)
- Chapter 5- Operations on Rational Numbers (Practice Set 25)
- Chapter 6- Indices (Practice Set 26)
- Chapter 6- Indices (Practice Set 27)
- Chapter 6- Indices (Practice Set 28)
- Chapter 6- Indices (Practice Set 29)
- Chapter 6- Indices (Practice Set 30)
- Chapter 7- Joint Bar Graph (Practice Set 31)
- Chapter 8- Algebraic Expressions and Operations on them (Practice Set 32)
- Chapter 8- Algebraic Expressions and Operations on them (Practice Set 33)
- Chapter 8- Algebraic Expressions and Operations on them (Practice Set 34)
- Chapter 8- Algebraic Expressions and Operations on them (Practice Set 35)
- Chapter 8- Algebraic Expressions and Operations on them (Practice Set 36)
- Chapter 9- Direct Proportion and Inverse Proportion (Practice Set 37)
- Chapter 9- Direct Proportion and Inverse Proportion (Practice Set 38)
- Chapter 9- Direct Proportion and Inverse Proportion (Practice Set 39)
- Chapter 10- Bank and Simple Interest (Practice Set 40)
- Chapter 10- Bank and Simple Interest (Practice Set 41)
- Chapter 11- Circle (Practice Set 42)

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- Chapter 11- Circle (Practice Set 43)
- Chapter 12- Perimeter and Area (Practice Set 44)
- Chapter 12- Perimeter and Area (Practice Set 45)
- Chapter 12- Perimeter and Area (Practice Set 46)
- Chapter 12- Perimeter and Area (Practice Set 47)
- Chapter 13- Pythagoras Theorem (Practice Set 48)
- Chapter 13- Pythagoras Theorem (Practice Set 49)
- Chapter 14- Algebraic Formulae - Expansion of Squares (Practice Set 50)
- Chapter 14- Algebraic Formulae - Expansion of Squares (Practice Set 51)
- Chapter 14- Algebraic Formulae - Expansion of Squares (Practice Set 52)
- Chapter 14- Algebraic Formulae - Expansion of Squares (Practice Set 53)
- Chapter 15- Statistics (Practice Set 54)
- Chapter 14- Statistics (Practice Set 55)

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The Maharashtra State Board of Secondary and Higher Secondary Education or MSBSHSE (Marathi: महाराष्ट्र राज्य माध्यमिक आणि उच्च माध्यमिक शिक्षण मंडळ), is an **autonomous and statutory body established in 1965**. The board was amended in the year 1977 under the provisions of the Maharashtra Act No. 41 of 1965.

The Maharashtra State Board of Secondary & Higher Secondary Education (MSBSHSE), Pune is an independent body of the Maharashtra Government. There are more than 1.4 million students that appear in the examination every year. The Maha State Board conducts the board examination twice a year. This board conducts the examination for SSC and HSC.

The Maharashtra government established the Maharashtra State Bureau of Textbook Production and Curriculum Research, also commonly referred to as Ebalbharati, in 1967 to take up the responsibility of providing quality textbooks to students from all classes studying under the Maharashtra State Board. MSBHSE prepares and updates the curriculum to provide holistic development for students. It is designed to tackle the difficulty in understanding the concepts with simple language with simple illustrations. Every year around 10 lakh students are enrolled in schools that are affiliated with the Maharashtra State Board.

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How many state boards are there in Maharashtra?

The Maharashtra State Board of Secondary & Higher Secondary Education, conducts the HSC and SSC Examinations in the state of Maharashtra through its nine Divisional Boards located at Pune, Mumbai, Aurangabad, Nasik, Kolhapur, Amravati, Latur, Nagpur and Ratnagiri.

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