Practice Sets for Mathematics for Class VIII

Covered all topics CBSE, ICSE, NCERT and all State Boards

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Contents

Introduction

This Books is prepared to boost concept in Mathematics, along with keeping in mind for Olympiad and Competitive based problems.

Part I

Problems on Algebra

Chapter 1

Formula based Square and Cube problems

1. $(a + b)^2 = a^2 + 2ab + b^2 = (a - b)^2 + 4ab$

2. $(a - b)^2 = a^2 - 2ab + b^2 = (a + b)^2 - 4ab$

3. $a^2 + b^2 = \begin{cases} (a + b)^2 - 2ab \\ (a - b)^2 + 2ab \\ \dfrac{1}{2}\left\{(a + b)^2 + (a - b)^2\right\} \end{cases}$

4. $\begin{cases} a^2 - b^2 & = (a + b) \cdot (a - b) \\ (a + b)^2 - (a - b)^2 & = 4ab \\ (a + b)(a - b) & = a^2 - b^2 \\ ab & = \left(\dfrac{a + b}{2}\right)^2 - \left(\dfrac{a - b}{2}\right)^2 \end{cases}$

5. $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$

6. $a^2 + b^2 + c^2 - ab - bc - ca = \dfrac{1}{2}\left\{(a - b)^2 + (b - c)^2 + (c - a)^2\right\}$

7. $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 = a^3 + b^3 + 3ab(a + b)$

8. $(a + b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 = a^3 - b^3 - 3ab(a - b)$

9. $a^3 + b^3 = \begin{cases} (a + b)^3 - 3ab(a + b) \\ (a + b)\left\{(a + b)^2 - 3ab\right\} \\ (a + b)(a^2 - ab + b^2) \end{cases}$

10. $a^3 - b^3 = \begin{cases} (a - b)^3 + 3ab(a - b) \\ (a - b)\left\{(a - b)^2 + 3ab\right\} \\ (a - b)(a^2 + ab + b^2) \end{cases}$

11. $a^3 + b^3 + c^3 - 3abc = \begin{cases} (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca) \\ \dfrac{1}{2}(a + b + c)\left\{(a - b)^2 + (b - c)^2 + (c - a)^2\right\} \end{cases}$

12. $(a + b + c)^3 = a^3 + b^3 + c^3 + 3(a + b)(b + c)(c + a)$

1.1   Problems

1.1.1   Check whether perfect square or not

1. $x^2 + 6xyz + 9y^2z^2$

2. $x^4 + 6x^2 + 16$

1.1.2   Which term needs to be added to make it a perfect square

1. $x^4 + 6x^2 + 16$

2. a^+9b^2

3. $a^6 - 6a^3 + 1$

4. $4a^4 + b^4$

1.1.3   Expand the followings

1. $(x + 4y)^2$

2. $(x + 4y - 5)^2$

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

4. $(x - 2y + 3z)^2$

1.1.4   Evaluate the followings

1. If $x + \dfrac{1}{x} = 2$, then calculate

   (a) $x^2 + \dfrac{1}{x^2}$

   (b) $x^3 + \dfrac{1}{x^3}$

   (c) $x^4 + \dfrac{1}{x^4}$

   (d) $x^{2025} + \dfrac{1}{x^{2025}}$

   (e) $x^a + \dfrac{1}{x^a}$, where a is any real number.

2. If $x + \dfrac{1}{x} = -2$, then calculate

   (a) $x^2 + \dfrac{1}{x^2}$

   (b) $x^3 + \dfrac{1}{x^3}$

   (c) $x^4 + \dfrac{1}{x^4}$

   (d) $x^{2025} + \dfrac{1}{x^{2025}}$

   (e) $x^a + \dfrac{1}{x^a}$, where a is any integer.

3. If $x + \dfrac{1}{x} = \sqrt{3}$, then calculate

    (a) $x^2 + \dfrac{1}{x^2}$

    (b) $x^3 + \dfrac{1}{x^3}$

    (c) $x^4 + \dfrac{1}{x^4}$

    (d) $x^5 + \dfrac{1}{x^5}$

    (e) $x^6 + \dfrac{1}{x^6}$

    (f) $x^{2025} + \dfrac{1}{x^{2025}}$

    (g) $x^a + \dfrac{1}{x^a}$, where a is any positive integer number.

4. If $x + \dfrac{1}{x} = -\sqrt{3}$, then calculate

    (a) $x^2 + \dfrac{1}{x^2}$

    (b) $x^3 + \dfrac{1}{x^3}$

    (c) $x^4 + \dfrac{1}{x^4}$

    (d) $x^5 + \dfrac{1}{x^5}$

    (e) $x^6 + \dfrac{1}{x^6}$

    (f) $x^{2025} + \dfrac{1}{x^{2025}}$

    (g) $x^a + \dfrac{1}{x^a}$, where a is any positive integer number.

Part II

Miscellaneous Practice Set

Chapter 1

MATHEMATICS Problem Set 01

Maximum Marks: 50   Time: 1 Hour 30 Minutes
Start Time: End Time:

Conceptual Questions (1 Mark each)