

# Maths Formulas for Class 10

## Chapter 1: Real Numbers

The first chapter of class 10th mathematics will equip you with a variety of concepts related to Natural numbers, Whole Numbers and Real Numbers, etc. Let us have a look at maths formula for class 10-

| Numbers          | Details  |
|------------------|--|
| Natural Numbers  | $N = \{ 1, 2, 3, 4, 5 \dots \}$  |
| Whole Numbers    | $W = \{ 0, 1, 2, 3, 4, 5 \dots \}$   |
| Rational Numbers | Those numbers which can be presented in the form of $a/b$ are called Rational Numbers. |
| Re Numbers       | Real Numbers can be found on a number line   |

## Chapter 2 Polynomials

Through the Polynomials chapter, you will have a firm understanding regarding various degree Polynomials such as Linear, Quadratic, Cubic etc. Here are the important formula for this chapter

| Polynomials | General Form                     | Formula   |
|-------------|----------------------------------|---|
| Linear      | $ax + b = 0, a \neq 0$           | $k = \frac{-constant}{coefficient(x)}$                        |
| Quadratic   | $ax^2 + bx + c = 0, a \neq 0$    | $k_1 + k_2 = \frac{coefficient(x)}{coefficient(x^2)}$         |
| Cubic       | $ax^3 + bx^2 + cx = 0, a \neq 0$ | $k_1 + k_2 + k_3 = \frac{coefficient(x^2)}{coefficient(x^3)}$ |

## Chapter 3: Pair of Linear Equations in Two Variables

It is an integral chapter containing a variety of important Maths formula for class 10 especially from the competitive exams point of view. Tabulated below are some of the formula of this chapter:

- Linear equation in one variable:  $ax + b = 0$
- Linear equation in two variables:  $ax + by + c = 0$
- Linear equation in three variables:  $ax + by + cz = 0$

## Chapter 4: Quadratic Equations

One of the most essential chapters which aim to create a sound foundation for upcoming higher studies in this subject. Refer below for the integral formulas of this chapter-

| Category                 | Formula                                  |
|--------------------------|--|
| Factorization            | $ax^2 + bx + c = 0$                      |
| Square/ Quadratic Method | $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ |

## Chapter 5: Arithmetic Progression

Arithmetic Progression is a crucial chapter for class 10th as it constitutes a majority of the questions both in scholastic as well as competitive exams. Here are some important maths formulas for class 10:

| Category                                       | Formula                                 |
|--|---|
| Common difference on an AP:                    | $D = a_2 - a_1 = a_3 - a_2 = a_4 - a_3$ |
| nth term of Arithmetic Progression:            | $n^{th} term = a + (n - 1)d$            |
| Sum of the nth item in Arithmetic Progression: | $s_n = (n/2)[a + (n - 1)d]$             |

## Chapter 6: Triangles

The sixth chapter onwards, your journey regarding the geometrical mathematics will begin. Through this unit, you will get to know about the application of various properties of triangles as well as how to use them in mathematical questions.

## Chapter 7: Coordinate Geometry

Going through the coordinate geometry chapter, you will be through with a variety of concepts which will be an integral part of higher-level mathematics in class 11th and 12th. Main topics and maths formula for class 10th are

| Category         | Formula   |
|------------------|---|
| Distance Formula | $D = \sqrt{x^2 + y^2}$  |
| Section Formula  | $x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2}$                             |
| Area of Triangle | $A = \frac{1}{2}[x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$ |

## Chapter 8: Trigonometry

A highly interesting chapter covering a wide range of formulas and topics which is also an important element of the class 10th board exams. Having a firm grip over Trigonometry formulas will help you achieve your dream score in exams:

| $\theta$     | $0^\circ$ | $30^\circ$ | $45^\circ$ | $60^\circ$ | $90^\circ$ | $180^\circ$ |
|--------------|-----------|------------|------------|------------|------------|-------------|
| <b>Sin</b>   | 0         | 1/2        | 1/2        | 3/2        | 1          | 0           |
| <b>Cos</b>   | 1         | 3/2        | 1/2        | 1/2        | 0          | -1          |
| <b>Tan</b>   | 0         | 1/3        | 1          | 3          | $\infty$   | 0           |
| <b>Cot</b>   | $\infty$  | 3          | 1          | 1/3        | 0          | $\infty$    |
| <b>Sec</b>   | 1         | 2/3        | 2          | 2          | $\infty$   | -1          |
| <b>Cosec</b> | $\infty$  | 2          | 2          | 2/3        | 1          | $\infty$    |

- $\text{Sin}\theta = 1/\text{Cosec}\theta$  or  $\text{Sin}\theta \cdot \text{Cosec}\theta = 1$
- $\text{Cos}\theta = 1/\text{Sec}\theta$  or  $\text{Cos}\theta \cdot \text{Sec}\theta = 1$
- $\text{Tan}\theta = 1/\text{Cot}\theta$  or  $\text{Tan}\theta \cdot \text{Cot}\theta = 1$
- $\text{Sin}(A+B) = \text{Sin}A \cdot \text{Cos}B + \text{Cos}A \cdot \text{Sin}B$
- $\text{Sin}(A-B) = \text{Sin}A \cdot \text{Cos}B - \text{Cos}A \cdot \text{Sin}B$
- $\text{Cos}(A+B) = \text{Cos}A \cdot \text{Cos}B - \text{Sin}A \cdot \text{Sin}B$
- $\text{Cos}(A-B) = \text{Cos}A \cdot \text{Cos}B + \text{Sin}A \cdot \text{Sin}B$

- $\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$
- $\tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$

## Chapter 10: Area of Circle

By going through this mathematics chapter regarding Circles, you will get to learn about various fundamentals which are involved in higher-level programs such as Engineering, Architecture, etc.

| Terms                   | Formula                      |
|-------------------------|------------------------------|
| Area of Circle          | $\pi r^2$                    |
| Circumference of Circle | $2\pi r$                     |
| Length of the Arch      | $\frac{\Theta}{360} 2\pi r$  |
| Area of the sector      | $\frac{\Theta}{360} \pi r^2$ |

## Chapter 12: Areas Related to Circle

Circles comprise of a multitude of figures inside it, hence via this chapter you will learn about other geometrical aspects of those figures.

| Terms                   | Formula                                 |
|-------------------------|---|
| Area of the Ring        | $a = \pi R^2 - \pi r^2$                 |
| Perimeter of Semicircle | $p = \pi r + 2r$                        |
| Perimeter of Sector     | $p = \frac{\pi r \Theta}{180} + 2\pi r$ |

## Chapter 13: Surface Area and Volume

Out of all, this chapter has been an integral part of maths syllabus since class 6th or 7th. Hence, in class 10th this chapter involves a variety of formulas to have a sound understanding of the concept.

**Terms****Formulas**

Surface Area of a Cuboid

$$s = 2(LB + BH + LH)$$

Total Surface Area of a Cylinder

$$s = 2\pi r(h + r)$$

Total Surface Area of a Cone

$$s = \pi r(l + r)$$

Surface Area of a Sphere

$$s = 4\pi r^2$$

Total Surface Area of a Frustum of a Cone

$$s = \pi l(r_1 + r_2) + \pi(r_1^2 + r_2^2)$$

## Chapter 14: Statistics

Important maths formulas for class 10th of this chapter are

**Terms      Formulas**

Mean

$$m = \frac{\sum f_i x_i}{\sum f_i}$$

Mode

$$M_o = l + \left( \frac{f_1 - f_0}{2f_1 - f_0 - f_2} \right) h$$

Median

$$M_m = l + \left( \frac{\frac{n}{2} - cf}{f} \right) h$$

## Chapter 15: Probability

The essential formula for the Probability chapter is:

$P(E) = \frac{\text{Number of outcome favourable}}{\text{Number of all possible outcomes of the experiment}}$