Class 10 Maths Formulas PDF

The Maths formulas for class 10 are the general formulas which are not only crucial for class 10 but also form the base for higher-level maths concepts. The maths formulas are also important in various higher education fields like engineering, medical, commerce, finance, computer science, hardware etc. Even in almost every industry, the most common formulas introduced in class 10 are used.

The class 10 maths formulas include formulas related to real numbers, polynomials, quadratic equations, triangles, circles, statistics, probability, (https://byjus.com/maths/probability/) etc. These maths formulas (https://byjus.com/math-formulas/) will be extremely helpful for students to be able to solve questions more accurately and quickly.

List of Maths Formulas for Class 10

The basic maths class 10 formulas are almost the same for all the boards. The list of maths formulas are:

- Pair of Linear Equation in Two Variables Formulas
- Algebra and Quadratic Equation Formulas
- Arithmetic Progression Formulas
- Trigonometry Formulas
- Circle Formulas
- Surface Area and Volume Formulas
- Statistics Formulas

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Linear Equations

One Variable	$ax+b=0$	$a \neq 0$ and a&b are real numbers
Two variable	$ax+by+c = 0$	$a \neq 0$ & $b \neq 0$ and a,b & c are real numbers
Three Variable	$ax+by+cz+d=0$	$a \neq 0$, $b \neq 0$, $c \neq 0$ and a,b,c,d are real numbers

Pair of Linear Equations in two variables:

$$a_1x+b_1+c_1=0$$
$$a_2x+b_2+c_2=0$$

Where

- a_1, b_1, c_1, a_2, b_2, and c_2 are all real numbers and
- $a_1^2 + b_1^2 \neq 0$ & $a_2^2 + b_2^2 \neq 0$

It should be noted that linear equations in two variables (https://byjus.com/maths/linear-equations-in-two-variables/) can also be represented in graphical form.

Algebra or Elgebraic Equations

The standard form of Quadratic Equations:

$$ax^2 + bx + c = 0 \text{ where } a \neq 0$$
$$\text{And } x = [-b \pm \sqrt{(b^2 - 4ac)}]/2ac$$

Algebraic formulas:

- $(a+b)^2 = a^2 + b^2 + 2ab$
- $(a-b)^2 = a^2 + b^2 - 2ab$
- $(a+b)(a-b) = a^2 - b^2$
- $(x + a)(x + b) = x^2 + (a + b)x + ab$
- $(x + a)(x - b) = x^2 + (a - b)x - ab$
- $(x - a)(x + b) = x^2 + (b - a)x - ab$
- $(x - a)(x - b) = x^2 - (a + b)x + ab$
- $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$
- $(a - b)^3 = a^3 - b^3 - 3ab(a - b)$
- $(x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2xz$
- $(x + y - z)^2 = x^2 + y^2 + z^2 + 2xy - 2yz - 2xz$
- $(x - y + z)^2 = x^2 + y^2 + z^2 - 2xy - 2yz + 2xz$
- $(x - y - z)^2 = x^2 + y^2 + z^2 - 2xy + 2yz - 2xz$
- $x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x2 + y2 + z2 - xy - yz -xz)$
- $x^2 + y^2 = \frac{1}{2}[(x + y)^2 + (x - y)^2]$
- $(x + a)(x + b)(x + c) = x^3 + (a + b + c)x^2 + (ab + bc + ca)x + abc$
- $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$
- $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$
- $x^2 + y^2 + z^2 - xy - yz - zx = \frac{1}{2}[(x-y)^2 + (y-z)^2 + (z-x)^2]$

Click here to check all algebra formulas (https://byjus.com/algebra-formulas/)

Basic formulas for powers

- $p^m \times p^n = p^{m+n}$
- $\{p^m\}/\{p^n\} = p^{m-n}$
- $(p^m)^n = p^{mn}$
- $p^{-m} = 1/p^m$
- $p^1 = p$
- $P^0 = 1$

Arithmetic Progression(AP) Formulas

If a_1, a_2, a_3, a_4, a_5, $a_6,...$ are the terms of AP and d is the common difference between each term, then we can write the sequence as; a, a+d, a+2d, a+3d, a+4d, a+5d,....,nth term... where a is the first term. Now, n^{th} term for arithmetic progression (https://byjus.com/maths/arithmetic-progression/) is given as;

$$n^{th} \text{ term = a + (n-1) d}$$

Sum of nth term in Arithmetic Progression;

$$S_n = n/2 \ [a + (n-1) \ d]$$

Trigonometry Formulas For Class 10

Trigonometry maths formulas for Class 10 covers three major functions Sine, Cosine and Tangent for a right-angle triangle. Also, in trigonometry (https://byjus.com/maths/trigonometry/), the functions sec, cosec and cot formulas can be derived with the help of sin, cos and tan formulas.

Let a right-angled triangle ABC is right-angled at point B and have $\angle\theta$.

$\text{Sin } \theta = \dfrac{Side\ opposite\ to\ angle\ \theta}{Hypotenuse} = \dfrac{Perpendicular}{Hypotenuse} = P/H$

$\text{Cos } \theta = \dfrac{Adjacent\ side\ to\ angle\ \theta}{Hypotenuse} = \dfrac{Adjacent side}{Hypotenuse} = B/H$

$\text{Tan } \theta = \dfrac{Side\ opposite\ to\ angle\ \theta}{Adjacent\ side\ to\ angle\ \theta} = P/B$

$\text{Sec } \theta = \dfrac{1}{cos\ \theta}$

$\text{Cot } \theta = \dfrac{1}{tan\ \theta}$

$\text{Cosec } \theta = \dfrac{1}{sin\ \theta}$

$\text{Tan } \theta = \dfrac{Sin\ \theta}{Cos\ \theta}$

Trigonometry Table

Angle	0°	30°	45°	60°	90°
Sinθ	0	1/2	1/√2	√3/2	1
Cosθ	1	√3/2	1/√2	½	0
Tanθ	0	1/√3	1	√3	Undefined
Cotθ	Undefined	√3	1	√3/2	0
Secθ	1	2/√3	√2	2	Undefined
Cosecθ	Undefined	2	√2	2/√3	1

Other Trigonometric formulas

- $\sin(90° - \theta) = \cos\theta$
- $\cos(90° - \theta) = \sin\theta$
- $\tan(90° - \theta) = \cot\theta$
- $\cot(90° - \theta) = \tan\theta$
- $\sec(90° - \theta) = \csc\theta$
- $\csc(90° - \theta) = \sec\theta$
- $\sin^2\theta + \cos^2\theta = 1$
- $\sec^2\theta = 1 + \tan^2\theta$ for $0° \leq \theta < 90°$
- $\csc^2\theta = 1 + \cot^2\theta$ for $0° \leq \theta \leq 90°$

Get complete Trigonometry Formulas list here
(https://byjus.com/maths/trigonometry-formulas/)

Circles Formulas For Class 10

- Circumference of the circle = $2\pi r$
- Area of the circle = πr^2
- Area of the sector of angle θ = $(\theta/360) \times \pi r^2$
- Length of an arc of a sector of angle θ = $(\theta/360) \times 2\pi r$

(r = radius of the circle)

Surface Area and Volumes Formulas For Class 10

The common formulas from the surface area and volumes
(https://byjus.com/maths/surface-areas-volumes/) chapter in 10th class include the
following:

- **Sphere Formulas**

Diameter of sphere	2r
Circumference of Sphere	2 π r
Surface area of sphere	4 π r^2
Volume of Cylinder	4/3 π r^2

- **Cylinder Formulas**

Circumference of Cylinder	2 πrh
Curved surface area of Cylinder	2 πr^2
Total surface area of Cylinder	Circumference of Cylinder + Curved surface area of Cylinder = 2 πrh + 2 πr^2
Volume of Cylinder	π r^2 h

- **Cone Formulas**

Slant height of cone	$l = \sqrt{(r^2 + h^2)}$
Curved surface area of cone	πrl
Total surface area of cone	πr (l + r)
Volume of cone	⅓ π r^2 h

- **Cuboid Formulas**

Perimeter of cuboid	4(l + b +h)
Length of the longest diagonal of a cuboid	$\sqrt{(l^2 + b^2 + h^2)}$
Total surface area of cuboid	2(l×b + b×h + l×h)
Volume of Cuboid	l × b × h

Here, l = length, b = breadth and h = height In case of Cube, put l = b = h = a, as cube all its sides of equal length, to find the surface area and volumes.

Statistics Formulas for Class 10

In class 10, the chapter statistics (https://byjus.com/maths/statistics/) mostly deals with finding the mean median and standard deviation of grouped data.

(I) The mean of the grouped data can be found by 3 methods.

1. **Direct Method:** $\bar{x} = \dfrac{\sum_{i=1}^{n} f_i x_i}{\sum_{i=1}^{n} f_i}$, where $f_i\, x_i$ is the sum of observations from value i = 1 to n And f_i is the number of observations from value i = 1 to n

2. **Assumed mean method** : $\bar{x} = a + \dfrac{\sum_{i=1}^{n} f_i d_i}{\sum_{i=1}^{n} f_i}$

3. **Step deviation method** : $\bar{x} = a + \dfrac{\sum_{i=1}^{n} f_i u_i}{\sum_{i=1}^{n} f_i} \times h$

(II) The mode of grouped data:

Mode = $l + \dfrac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$

(III) The median for a grouped data:

Median = $l + \dfrac{\frac{n}{2} - cf}{f} \times h$

Check out more important class 10 maths resources from below:

Class 10 Maths Important Questions (https://byjus.com/maths/important-questions-class-10-maths/)	Revision Notes For Class 10th Maths (https://byjus.com/cbse-notes/class-10-maths-revision-notes/)

Sample Papers For Class 10 Maths (https://byjus.com/cbse-class-10-sample-papers-for-maths/)	Previous Year Question Papers For Class 10 Maths (https://byjus.com/cbse-study-material/class-10-maths-previous-year-papers/)

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Maths Formulas for Class 8 (https://byjus.com/maths/maths-formulas-for-class-8/)	Maths Formulas for Class 9 (https://byjus.com/maths/maths-formulas-for-class-9/)	Maths Formulas for Class 11 (https://byjus.com/maths/maths-formulas-for-class-11/)	Maths Formulas for Class 12 (https://byjus.com/maths/math-formulas-for-class-12/)