Maths Important Formulas for Class 9

Below listed are the important formulae which are required to solve various maths problems for Class 9.

Geometry

Geometry Shapes Formulas for Class 9		
Geometric Figure	**Area**	**Perimeter**
Rectangle	$A = l \times w$	$P = 2 \times (l+w)$
Triangle	$A = (\frac{1}{2}) \times b \times h$	$P = a + b + c$
Trapezoid	$A = (\frac{1}{2}) \times h \times (b_1 + b_2)$	$P = a + b + c + d$
Parallelogram	$A = b \times h$	$P = 2(a+b)$
Circle	$A = \pi r^2$	$C = 2\pi r$

Surface Area and Volumes

Shape	Surface Area	Volume
Cuboid	$2(lb + bh + lh)$ l= length, b=breadth, h=height	lbh
Cube	$6a^2$	a^3
Cylinder	$2\pi r(h+r)$ r = radius of circular bases h = height of cylinder	$\pi r^2 h$
Cone	$\pi r(l+r)$ r=radius of base l=slant height Also, $l^2 = h^2 + r^2$, where h is the height of cone	$(1/3)\pi r^2 h$
Sphere	$4\pi r^2$	$(4/3)\pi r^3$

Algebra

Algebraic Identities For Class 9
$(a+b)^2 = a^2 + 2ab + b^2$
$(a-b)^2 = a^2 - 2ab + b^2$
$(a+b)(a{-}b) = a^2{-}b^2$
$(x+a)(x+b) = x^2 + (a+b)x + ab$
$(x+a)(x{-}b) = x^2 + (a{-}b)x{-}ab$
$(x{-}a)(x+b) = x^2 + (b{-}a)x{-}ab$
$(x{-}a)(x{-}b) = x^2{-}(a+b)x + ab$
$(a+b)^3 = a^3 + b^3 + 3ab(a+b)$
$(a{-}b)^3 = a^3{-}b^3{-}3ab(a{-}b)$
$(x+y+z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2xz$
$(x+y{-}z)^2 = x^2 + y^2 + z^2 + 2xy{-}2yz{-}2xz$
$(x{-}y+z)^2 = x^2 + y^2 + z^2{-}2xy{-}2yz + 2xz$
$(x{-}y{-}z)^2 = x^2 + y^2 + z^2{-}2xy + 2yz{-}2xz$
$x^3 + y^3 + z^3{-}3xyz = (x+y+z)(x^2 + y^2 + z^2{-}xy{-}yz - xz)$
$x^2 + y^2 = \frac{1}{2}\left[(x+y)^2 + (x{-}y)^2\right]$
$(x+a)(x+b)(x+c) = x^3 + (a+b+c)x^2 + (ab+bc+ca)x + abc$
$x^3 + y^3 = (x+y)(x^2{-}xy + y^2)$
$x^3{-}y^3 = (x{-}y)(x^2 + xy + y^2)$
$x^2 + y^2 + z^2 - xy{-}yz{-}zx = \frac{1}{2}\left[(x-y)^2 + (y-z)^2 + (z-x)^2\right]$

Heron's Formula

$Area\ of\ triangle\ using\ three\ sides = \sqrt{s(s-a)(s-b)(s-c)}$
Semi-perimeter, s = (a+b+c)/2

Polynomial

Polynomial Formula
$P(x) = a_n x^n + a_{n-1} x^{n-1} - a_{n-2} x^{n-2} + \ldots\ldots + ax + a_0$

Statistics

Measure of Central Tendency	
Mean	Sum of Observation/Total number of observation = $\sum$ x/n
Median	[(n+1)/2]th term [For odd number of observation] Mean of (n/2)th term and (n/2+1)th term [For even number of observation]
Mode	Value which is repeated maximum time in a data set

Probability

Empirical Probability = Number of trials with expected outcome/Total number of Trials