Class 10th (C.B.S.E.)

Basic Mathematics formulas

Algebra

    1. Quadratic Formula: $x = (-b \pm \sqrt{(b^2 - 4ac)}) / 2a$

    2. Linear Equation: $ax + by = c$

    3. Quadratic Equation: $ax^2 + bx + c = 0$

    4. Arithmetic Progression (AP): $a_n = a + (n - 1)d$

    5. Geometric Progression (GP): $a_n = ar^{(n-1)}$

    6. Sum of n terms of AP: S_n = $(n/2) [2a + (n-1)d]$

    7. Sum of n terms of GP: S_n = $a(1 - r^n) / (1 - r)$

Geometry

    1. Pythagoras Theorem: $a^2 + b^2 = c^2$ (right-angled triangle)

    2. Area of Triangle: (base × height) / 2

    3. Area of Circle: πr^2

    4. Circumference of Circle: $2\pi r$

    5. Area of Sector: $(\theta / 360) \times \pi r^2$

    6. Area of Parallelogram: base × height

    7. Area of Trapezium: $(1/2) \times$ (sum of parallel sides) × height

Trigonometry

    1. Sine: sin θ = perpendicular (p) / hypotenuse (h)

    2. Cosine: cos θ = base (b) / hypotenuse (h)

    3. Tangent: tan θ = Perpendicular (p) / base (b)

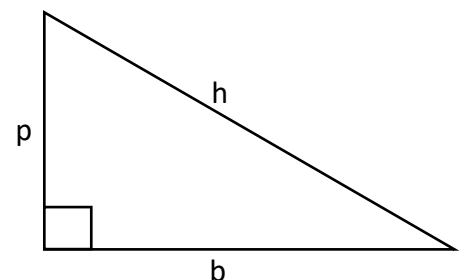   **4. Trigonometric Identities:**

      - $\sin^2 \theta + \cos^2 \theta = 1$

      - $\tan \theta = \sin \theta / \cos \theta$

      - $\cot \theta = \cos \theta / \sin \theta$

      - $\sec \theta = 1 / \cos \theta$

      - $\csc \theta = 1 / \sin \theta$

Statistics and Probability

    1. Mean: (sum of observations) / (number of observations)

    2. Median: middle value of observations (when arranged in order)

    3. Mode: most frequently occurring value

    4. Probability: (number of favourable outcomes) / (total number of outcomes)

    5. Range: difference between largest and smallest values

    6. Variance: average of squared differences from mean

    7. Standard Deviation: square root of variance

Mensuration

    1. Area of Rectangle: length × width

    2. Area of Square: side^2

    3. Volume of Cube: side^3

    4. Volume of Cuboid: length × width × height

    5. Surface Area of Cube: $6 \times \text{side}^2$

    6. Surface Area of Cuboid: 2×(length × width + width × height + height × length)

    7. Volume of Cylinder: $\pi r^2 h$

Coordinate Geometry

    1. Distance Formula: $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

    2. Section Formula: $(x, y) = ((mx_2 + nx_1) / (m + n), (my_2 + ny_1) / (m + n))$

    3. Midpoint Formula: $(x, y) = ((x_1 + x_2) / 2, (y_1 + y_2) / 2)$

    4. Slope of a Line: $(y_2 - y_1) / (x_2 - x_1)$