

Chapter 2: Polynomials

③ Quadratic polynomial formula! -

$$ax^2 + bx + c$$

④ Sum and product of Roots! -

$$\text{Sum of roots} = -\frac{b}{a}$$

$$\text{Product of roots} = \frac{c}{a}$$

Ch: 3 :- Pair of linear equations in two variables

⑤ General form! -

$$a_1x + b_1y + c_1 = 0$$

$$a_2x + b_2y + c_2 = 0$$

⑥ Condition for consistency! -

• Consistent : $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

• Inconsistent : $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

• Dependent : $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Chapter 4: Quadratic equations

⑦ Standard form! -

$$ax^2 + bx + c = 0$$

⑧ Roots formula! -

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

- $b^2 - 4ac > 0$: Two distinct real roots
- $b^2 - 4ac = 0$: Two equal real roots
- $b^2 - 4ac < 0$: No real roots

Chapter 5: Arithmetic Progressions

(9) n^{th} Term
$$a_n = a + (n-1)d$$

(10) Sum of n Terms :-

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$$S_n = \frac{n}{2} (a+l)$$

Chapter 6:- Triangles

(11) Basic proportionality Theorem:-

If a line is parallel to one side of a triangle and intersects the other two sides, it divides them proportionally.

(12) Pythagoras Theorem:-

$$a^2 + b^2 = c^2$$

(13) Area ratio of Similar Triangles:-

$$\frac{\text{Area of } \Delta 1}{\text{Area of } \Delta 2} = \left(\frac{\text{Side 1}}{\text{Side 2}} \right)^2$$

Chapter 7:- Coordinate Geometry

(14) Distance formula :

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

(15) Midpoint Formula! -

$$\text{Midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

(16) Area of Triangle! -

$$\text{Area} = \frac{1}{2} \left[x_1 (y_2 - y_3) + x_2 (y_3 - y_1) + x_3 (y_1 - y_2) \right]$$

Chapter 8! - Introduction of Trigonometry

(17) Trigonometric ratios! -

$$\sin \theta = \frac{\text{opposite side}}{\text{Hypotenuse}}$$

Hypotenuse

$$\cos \theta = \frac{\text{Adjacent side}}{\text{Hypotenuse}}$$

Hypotenuse

$$\tan \theta = \frac{\sin \theta}{\cos \theta} = \frac{\text{opposite side}}{\text{Adjacent side}}$$

(18) Pythagorean Identities? →

$$\sin^2 \theta + \cos^2 \theta = 1 \textcircled{P}$$

$$1 + \tan^2 \theta = \sec^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

Chapter 9 :- Applications and Trigonomet
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- Height and distance: use trigonometric ratios in right triangles to solve problems.

* Chapter 10:- Circles

(19) Tangents:- Tangent to a circle is perpendicular to the radius at the point of contact.

* Chapter 11:- Constructions

(20) No specific formulas, follow geometric constructions scales.

* Chapter 12: Areas related to circles

(21) Area of circle:-
 $A = \pi r^2$

(22) Circumference of circle:-

$$C = 2\pi r$$

(23) Area of sector:-

$$A = \frac{\theta}{360^\circ} \times \pi r^2$$

(24) Length of Arc :-

$$L = \frac{\theta}{360^\circ} \times 2\pi r$$

Chapter 13: Surface area and Volumes

(25) Surface Area of cube :-

$$6a^2$$

(26) Surface area of cuboid :-

$$2(lb + bh + hl)$$

(27) Surface area of sphere :-

$$4\pi r^2$$

(28) Volume of Sphere :-

$$\frac{4}{3} \pi r^3$$

(29) Surface area of cylinder! -

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

(30) Volume of cylinder! -

$$\pi r^2 h$$

(31) Surface area of cone! -

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

(32) Volume of Cone! -

$$\frac{1}{3} \pi r^2 h$$

Chapter 14 :- Statistics

(33) Mean :-

$$\text{Mean} = \frac{\sum f_i x_i}{\sum f_i}$$

(34) Median :-

$$L + \left(\frac{\frac{N}{2} - CF}{f} \right) \times h$$

(35) Mode :-

$$L + \left(\frac{f_m - f_1}{2f_m - f_1 - f_2} \right) \times h$$

Chapter 15 :- Probability

(36) Probability formula :-

$$P(E) = \frac{\text{Number of favorable outcomes}}{\text{Total number of outcomes}}$$