

Class XIth

Formulas [ch-1 and ch-2]

1. If $A \cap B = \phi$ they called disjoint set.
2. (a) $(A \cup B)' = A' \cap B'$ (b) $(A \cap B)' = A' \cup B'$
3. $n(A \cup B) = n(A) + n(B) - n(A \cap B)$
4. $n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(C \cap A) + n(A \cap B \cap C)$
5. $n(A - B) = n(A \cap B') = n(A) - n(A \cap B)$
6. $n(B - A) = n(B \cap A') = n(B) - n(A \cap B)$
7. $n(A') = n(U) - n(A)$
8. (a) $U' = \phi$ (b) $\phi' = U$
9. No. of subsets = $2^{\text{no. of elements}}$
10. No. of Relation = $2^{n(A \times B)}$

VIBA CLASSES
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Class XIth

Formulas [Ch-5, 7 & 8]

Ch-5 Complex Numbers

1. Standard form $z = a + bi$

2. $i = \sqrt{-1}$, $i^2 = -1$, $i^3 = -i$, $i^4 = 1$
 $i^{4n} = 1$

3. $|z| = \sqrt{a^2 + b^2}$, $\bar{z} = \overline{a + bi} = a - bi$

4. $z^{-1} = \frac{\bar{z}}{|z|^2}$

5. $z \bar{z} = |z|^2$

5. modulus = $r = |z|$, Argument = θ

$\alpha = \tan^{-1} \left| \frac{b}{a} \right|$

$\theta = \pi - \alpha$

$\theta = \alpha$

$\theta = -\pi + \alpha$

$\theta = -\alpha$

Polar form

$z = r \cos \theta + r \sin \theta i$

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

VIB A
Classes

Ch-7 Permutation

1. $nPr = \frac{n!}{n-r!}$

2. $nCr = \frac{n!}{r!(n-r)!}$

3. $nCr = \frac{n!}{r!}$

4. $nCa = nCb \Rightarrow n = a + b$

5. $nC0 = nCn = 1$

6. $nCn = n$

Ch-8 Binomial theorem

1. $(a+b)^n = nC_0 a^n b^0 + nC_1 a^{n-1} b^1 + nC_2 a^{n-2} b^2 + \dots + nC_n a^0 b^n$

2. General term $T_{r+1} = nC_r (a)^{n-r} (b)^r$

3. middle term if n is odd $\left(\frac{n+1}{2}\right)^{th}$ & $\left(\frac{n+3}{2}\right)^{th}$ term.

$(a+b)^n$ if n is even $\left(\frac{n+2}{2}\right)^{th}$ term

ch-9
class-XI
Sequence & Series [formulas]

A Arithmetic Progression (A.P)

1. General Term $a_n = a + (n-1)d$
2. Sum of Terms $S_n = \frac{n}{2} [a + l]$ or $\frac{n}{2} [2a + (n-1)d]$
3. Arithmetic mean = $\frac{a+b}{2}$
4. If 3 terms are in A.P $a, b, c \Rightarrow 2b = a + c$

B Geometric Progression (G.P)

1. General Term $a_n = ar^{n-1}$
2. Sum of Terms $\begin{cases} \text{if } r > 1 & S_n = \frac{a(r^n - 1)}{r - 1} \\ \text{if } r < 1 & S_n = \frac{a(1 - r^n)}{1 - r} \end{cases}$
3. Geometric mean = \sqrt{ab}
4. If 3 terms are in G.P $a, b, c \Rightarrow b^2 = a \cdot c$

C Special Series

1. $1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$
2. $1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$
3. $1^3 + 2^3 + 3^3 + \dots + n^3 = \left(\frac{n(n+1)}{2}\right)^2$

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Ch-10
Straight line [Formulas]

class-XIth

A) Slope of line

1. slope = $m = \frac{y_2 - y_1}{x_2 - x_1} = \tan \theta = \frac{dy}{dx}$
2. If two lines are $\perp \Rightarrow m_1 \times m_2 = -1$
3. If two lines are $\parallel \Rightarrow m_1 = m_2$
4. If line is \parallel to x-axis $\Rightarrow m = 0$
5. If line is \parallel to y-axis $\Rightarrow m = \infty$
6. Angle b/w two lines $\tan \theta = \left| \frac{m_2 - m_1}{1 + m_1 m_2} \right|$

B) Equation of line

- (a) x-Intercept form $y = m(x - d)$
- (b) y-Intercept $y = mx + c$
- (c) Intercepts form $\frac{x}{a} + \frac{y}{b} = 1$
- (d) one point (x_1, y_1) and slope given $\Rightarrow y - y_1 = m(x - x_1)$
- (e) Two points (x_1, y_1) & (x_2, y_2) are given $m = \frac{y_2 - y_1}{x_2 - x_1}$
 $y - y_1 = m(x - x_1)$
- (f) Normal form $x \cos \alpha + y \sin \alpha = p$

C) General Equation of line

- (a) Slope Intercept form $Ax + By + C = 0 \Rightarrow y = mx + c$
 $m = -\frac{A}{B} \quad c = -\frac{C}{B}$
- (b) Intercept form $Ax + By + C = 0 \Rightarrow \frac{x}{a} + \frac{y}{b} = 1$
 $a = -\frac{C}{A} \quad b = -\frac{C}{B}$
- (c) Normal form $Ax + By + C = 0 \Rightarrow x \cos \alpha + y \sin \alpha = p$
 $\cos \alpha = \frac{\pm A}{\sqrt{A^2 + B^2}} \quad \sin \alpha = \frac{\pm B}{\sqrt{A^2 + B^2}} \quad p = \frac{\pm C}{\sqrt{A^2 + B^2}}$

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