Chapters	Important Formulas
HCF & LCM	a×b = HCF (a,b) × LCM (a,b)
	For fractions: $\text{HCF} = \frac{\text{HCF of numerators}}{\text{LCM of denominators}}, \quad \text{LCM} = \frac{\text{LCM of numerators}}{\text{HCF of denominators}}$
Factors	If $n = p_1^{a_1} \times p_2^{a_2} \times p_3^{a_3} \ldots$, then: • **Number of factors:** $(a_1+1)(a_2+1)(a_3+1)\ldots$ • **Sum of factors:** $(1+p_1+p_1^2+\cdots+p_1^{a_1})(1+p_2+\cdots+p_2^{a_2})\ldots$ • **Product of factors:** $n^{(\text{number of factors})/2}$
Remainders (Modulo Arithmetic)	• (a+b) mod m = [(a mod m) + (b mod m)] mod m • (a−b) mod m = [(a mod m) −(b mod m)] mod m • (a×b) mod m = [(a mod m) × (b mod m)] mod m
	Fermat's theorem: If ppp is prime and aaa not divisible by p, then $A^{p-1} \equiv 1 \pmod p$
	Euler's theorem: $a^{\phi(n)} \equiv 1 \pmod n$ where ϕ(n) = Euler's totient function.
Euler's Totient Function	If $n = p_1^{a_1} p_2^{a_2} \ldots$, $\phi(n) = n\left(1-\frac{1}{p_1}\right)\left(1-\frac{1}{p_2}\right)\ldots$
Base System	Converting number from base b to decimal: $(d_k d_{k-1} \ldots d_1 d_0)_b = d_k b^k + d_{k-1} b^{k-1} + \cdots + d_1 b + d_0$
Properties of Numbers	• Even × Even = Even, Even × Odd = Even, Odd × Odd = Odd • Even ± Even = Even, Odd ± Odd = Even, Even ± Odd = Odd
Sum of Series	First n natural number $\frac{n(n+1)}{2}$
	Sum of Squares $\frac{n(n+1)(2n+1)}{6}$

	Sum of Cubes $\left(\frac{n(n+1)}{2}\right)^2$