1. **Theorem**: Given a number N, let d be a divisor of N. Then the number of pairs $\{a,N\}$, where $1 \le a \le N$ and $\gcd(a,N)=d$, is $\phi(N/d)$.
2. Approximate number of primes under n= (n/ln(n))
3. Approximate upper limit of number of divisor $=2\sqrt[3]{N}$
4. Diphonite eqn gulai negative number niye hisab korte hbe (see hyperbolic eqn in khata)
5. Once we find a pair (x,y) using ext_gcd, we can generate infinite pairs of Bezout coefficients using the formula:

$$(x+(k*b)/\gcd(a,b), y-(k*a)/\gcd(a,b))$$

6. **Goldbach's Conjecture:**
For any integer n ($n \geq 4$) there exist two prime numbers $p1$ and $p2$ such that $p1 + p2 = n$.
7. For a given positive integer n ($0 < n < 231$) we need to find the number of such m that $1 \leq m \leq n$, GCD(m, n) $\neq 1$ and GCD(m, n) $\neq m$
$n - \varphi(n) - (a1 + 1) * (a2 + 1) * \ldots * (ak + 1) + 1$
8. Summation of any series with equal interval like:
2+4+5+6 or 3+6+9+12 is equal
Sum=n*(first number+last number)/2
9. Upper limit for n*(n+1)/2 is 1414213563
10. **Right Angle Triangle :**
If the given side is an even number, then find (N^2)/4. The integer before and after this value will make a right angled triangle. Example, if 8 is the given side, then (8^2)/4 = 16. So the other two sides of the right angled triangle will be 15 and (edit)17.
Now if the given side is an odd number, then find (N^2)/2. Here also, the integers before and after the found out value will make the right angled triangle. For example, if 3 is the number. Then (3^2)/2 = 4.5 So the other two sides will be 4 and 5.
11. (a^(b^c))%mod=(a^(b^c)%phi(m))%m **(provided a and m coprime)**
12. a^x % m = ((a%m) ^ (x%phi(m))) %m **(provided a and m coprime)**