Geometry:

- Point class/structure with vector operations
- Dot product of vectors ab * bc
- Cross product
- Area of polygon represented by vectors x, y
- Is point c left of the line determined by (a, b)?
- Is point c left of or on the line determined by (a, b)?
- Is point c left or on line segment a -> b?
- Is point c on the line determined by (a, b)?
- Points a,b,c are collinear and c lies in segment ab
- Does segment a-b properly intersects c-d?
- Segments ab and cd intersect, properly or improperly
- Compute the distance from AB to C
- Compute the distance from Point A to Point B
- Closest pair of points
- Convexhull
- Greatest Circle Distance

Number Theory:

- Extended GCD, solves ax + by = GCD(a,b)
- Solve system of modular linear equations
  Recursive Power Mod (exponentiation by squaring)
- Fermat's Little Theorem for mod inverse
- Euler's Theorem
  Rabin miller primes
- Sieve of Erastothenes
- Prime Factorization
- Euler's totient function (counts the number of positive integers less than or equal to n that are relatively prime to n)
- Chinese Remainder theorem
- Gauss elimination
- Matrix arithmetic
- Biginteger

Combinatorics

- nChooseK
- Pascal Triangle
- nChooseKMod