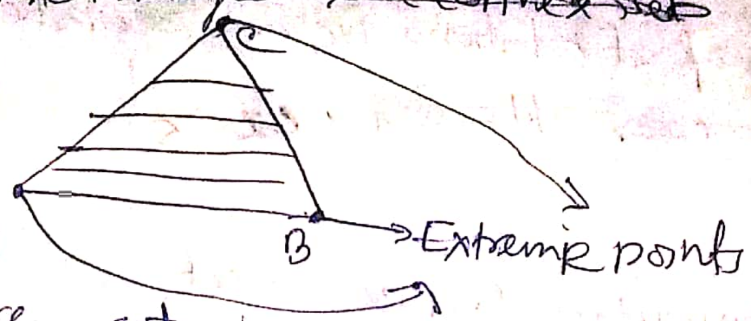
Extreme point:

Example. The ~~triangle~~ region inside triangle ~~is a convex set~~



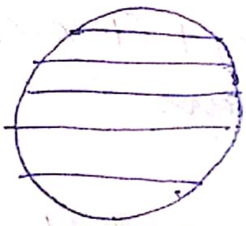
The above set is a convex set

(A, B) → adjacent points

(A, C) → adjacent points

(B. C) → adjacent ~~point~~ points

// Every point on the boundary of the. ~~circle~~ circular region i.e. on the circumference is an extreme point.



$x^2 + y^2 \leq r^2$

Convex hull: The set of all convex combination of the points from a set consisting of points is known as convex ~~hull~~ hull.

Let X be a set ~~then~~ and $C(X)$ is the convex hull then. $C(X)$ is the smallest of the convex sets consisting of points of X.

If $|X|$ = finite then $C(X)$ is called a convex polyhedron.

~~An n dimensional~~

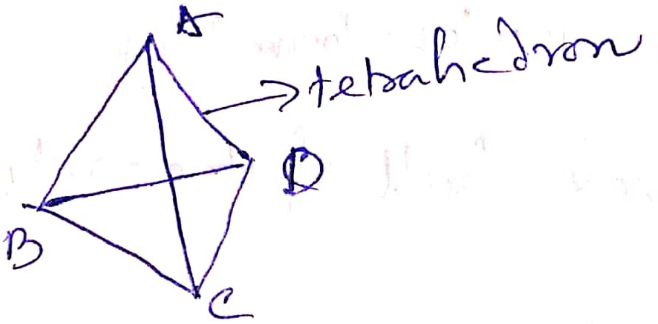
Simplex: ~~If~~ A simplex is a n dimensional convex polyhedron with $(n+1)$ vertices.

0 - dimensional simplex = point

1 - dimensional simplex = line (2 end point / vertices)

Two dimensional simplex = triangle (3 vertices)

Three dimensional simplex = tetrahedron. (4 vertices)



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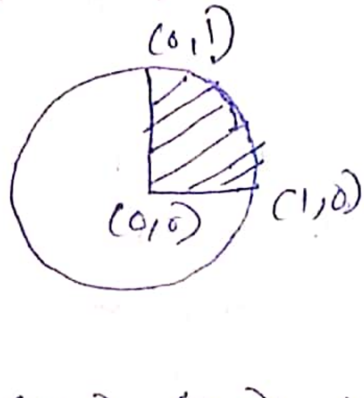
Find the extreme points.

$S = \{(x_1, x_2) : x_1^2 + x_2^2 \leq 1, x_1 \geq 0, x_2 \geq 0\}$



The shaded region indicates $x_1^2 + x_2^2 \leq 1, x_1 \geq 0,$ $x_2 \geq 0.$

Hence the extreme points are $(0,1), (0,0), (1,0)$ and all points on the circular boundary.

~~the convex hull of the points.~~

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