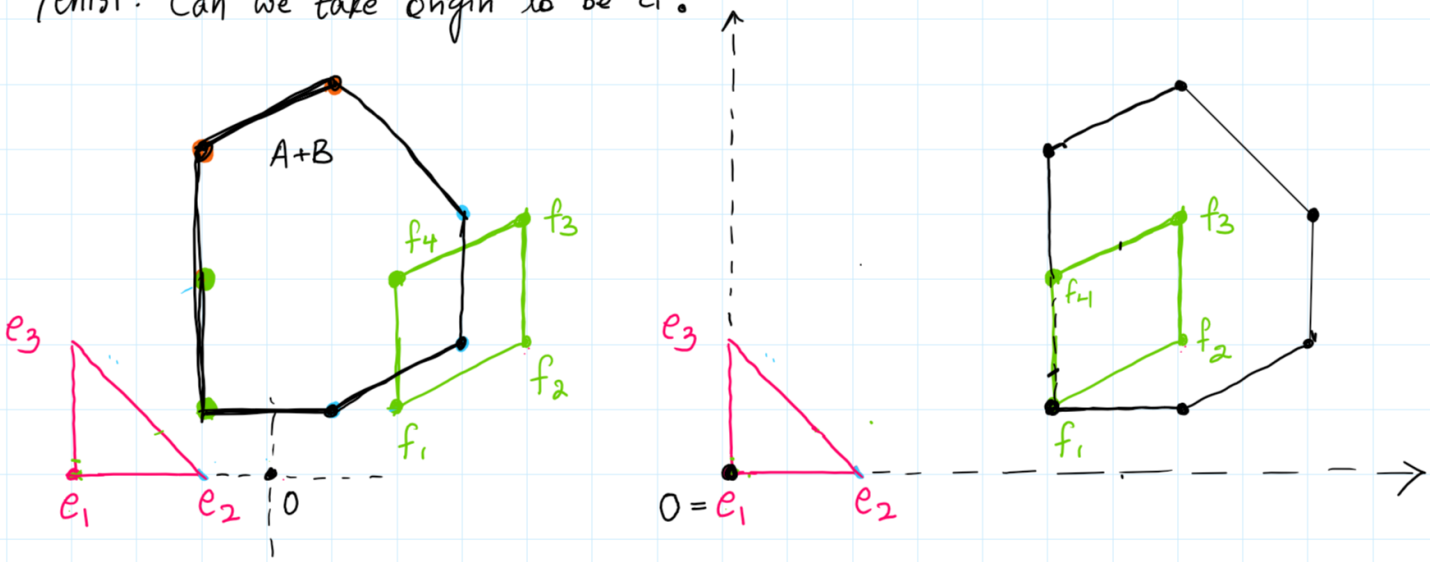
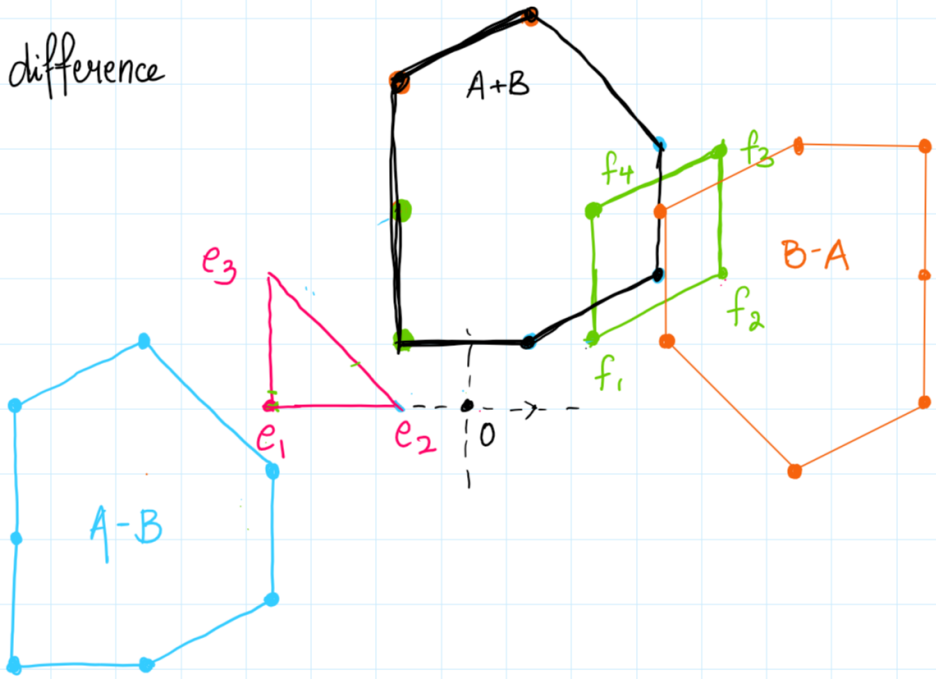
June 25, 2021

Yenisi: Can we take origin to be e_1?



Theorem $(A-x)+(B-x) = A+B-2x$.

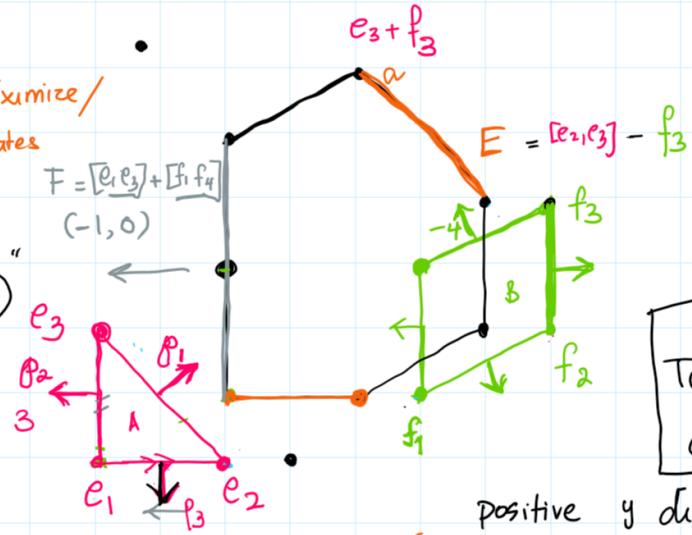
Minkowski difference



Kanupriya

Take vertices that maximize/ minimize x, y coordinates

"Polar coordinates (angle & direction)"



Soumi:

sides (A+B) ≤ # sides (A) + # sides (B)

Complexity of computing A+B ≈ k+m.

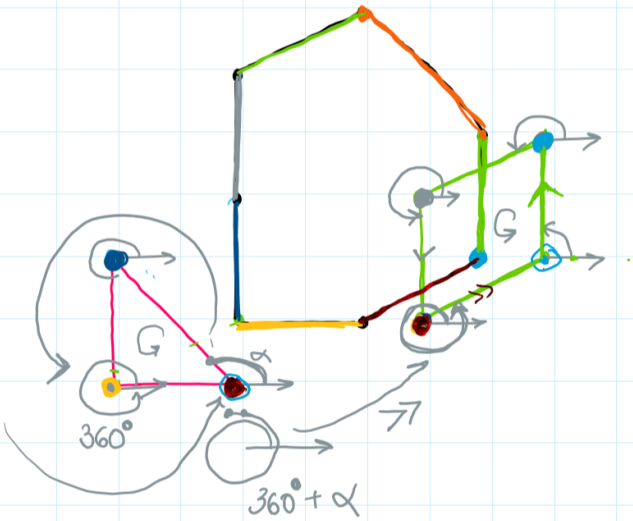
Total # of directions to check ≤ # sides (A) + # sides (B)

positive y direction

a is the furthest point in the $(0,1)$ direction in $A+B$.
$= e_3$ " " " " " in A
$+ f_3$ " " in B.

E is the furthest set of points in the direction v in $A+B$
$= [e_2, e_3]$ " " v in A
$+ f_3$ " " in B.

An algorithm with $\leq k+m$ steps

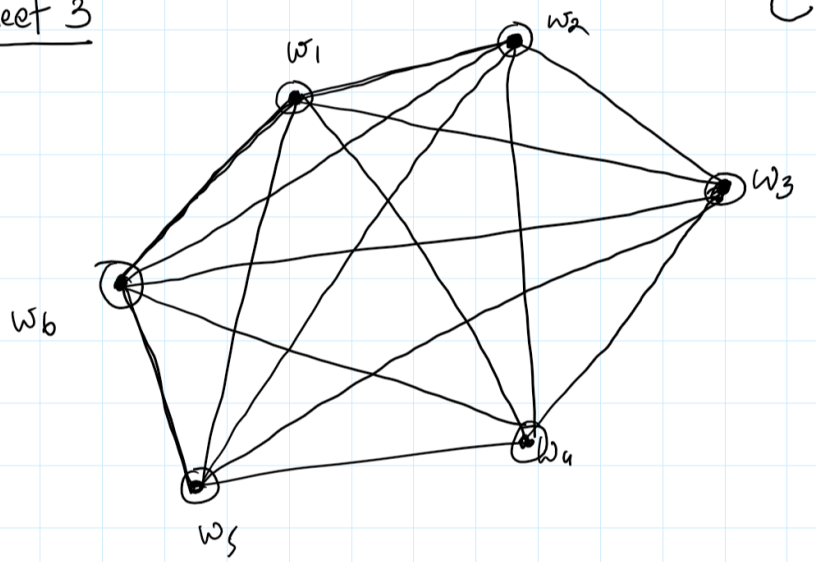


Green angle < pink angle

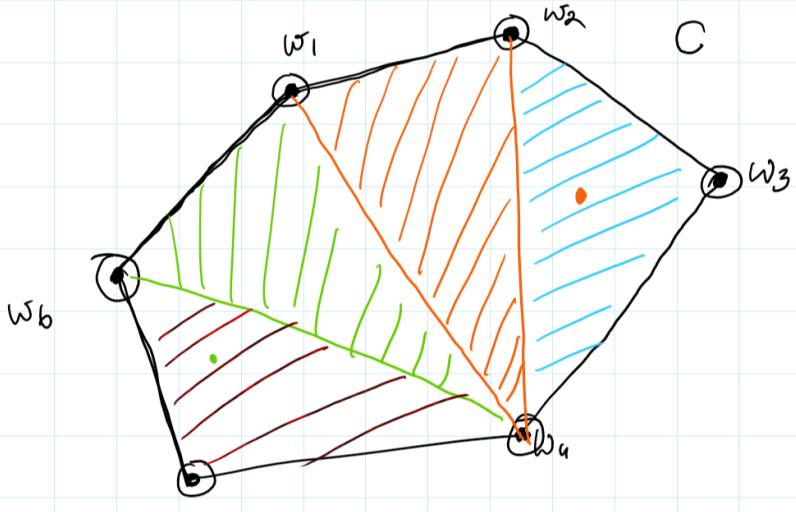
at most 3+4 st

Worksheet 3

C



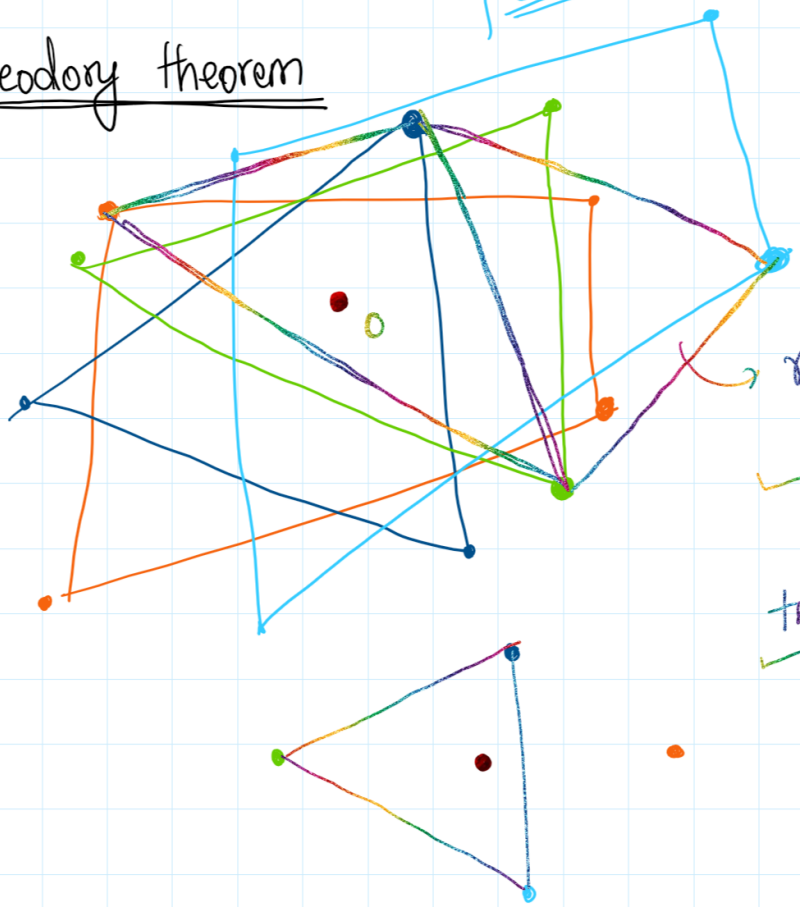
C



Caratheodory's theorem: Let z be in the convex hull of some points $w_1, \dots, w_k \in \mathbb{R}^2$. Then, z is in the convex hull of three points in $\{w_1, \dots, w_k\}$.

connection?

Colorful Caratheodory theorem



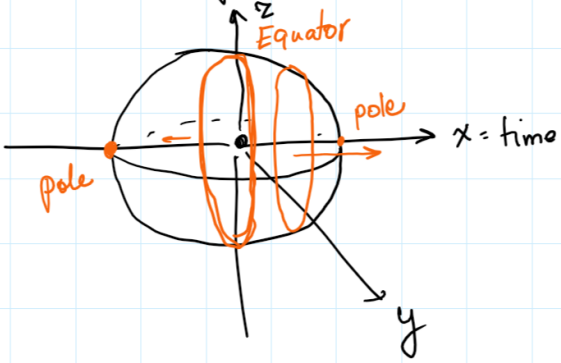
∃ rainbow simplex!!

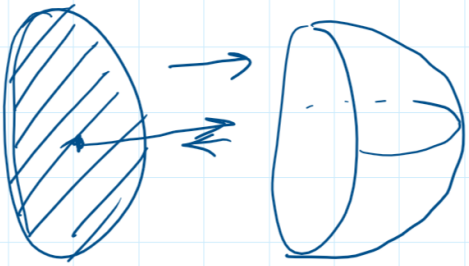
triangles.

* How many rainbow simplices for one point?

Visualizing in 4-d.

$x^2+y^2+z^2=1$



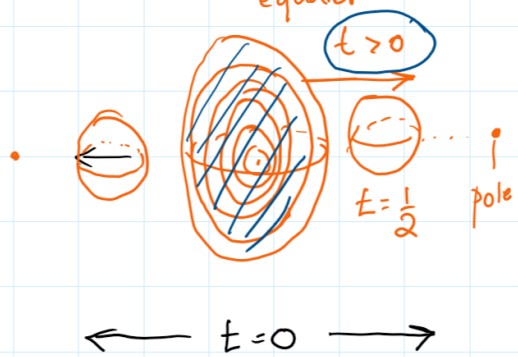


Minkowski space

time

$x^2+y^2+z^2-t^2=1$

equator



$t=0$

$x^2+y^2+z^2+\frac{1}{4}=1$

$$x^2+y^2+z^2=\frac{3}{4}$$