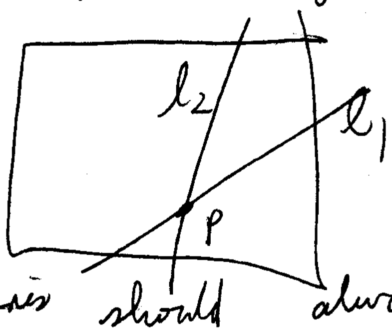
## Projective space

Geometry, Topology, Algebra, Analysis, Combinatorics.

"down to earth".

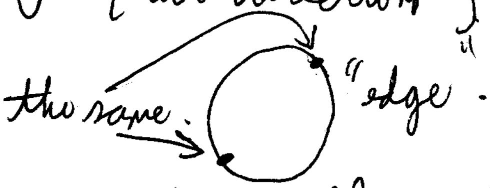



$l_1$ & $l_2$ intersect.

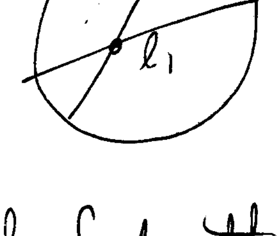
Fix $l_1$. Move $l_2$.

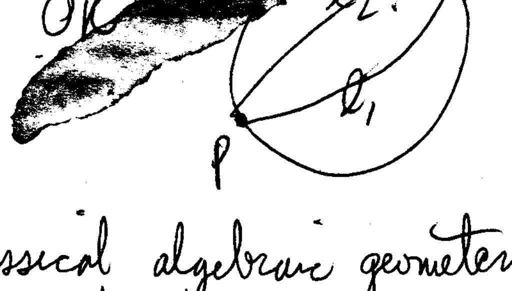
p moves. Two lines should always intersect. As slope $l_2 \to$ slope $l_2$, p moves "out". Want them still to intersect in some ideal sense. So to a copy of the plane join a set of all "directions" in the plane.

$\boxed{\text{plane}}$ $\cup$ {all directions}




Then any two lines in this geometric setting always have a unique point of intersection.




(both "points" are p).

In fact, the classical algebraic geometers deal with more than lines (Bezout's Theorem, e.g.) and other problems