Convex Theories

- Geometrically, a union of sets is not convex except in very special cases

Union of solutions = disjunction of formulas

- **A *convex theory* implies a disjunction of equalities iff it implies one of the disjuncts.**
- Convex theories are theories that allow us to avoid guessing the arrangement
- Idea: instead of just checking SAT/UNSAT, the decision procedure will derive all equalities that follow from the conjunction.

Examples

- Convex theories
  - linear arithmetic over rational numbers
  - quantifier-free uninterpreted functions
  - quantifier-free term algebras
- Non-convex: integer linear arithmetic

  $y=1 \wedge z=2 \wedge 0 < x \wedge x < 3$