Reality
Difficult shapes
Difficult stress fields
Non linear materials
Tangential forces from friction
Impossible to solve

Simplfying Assumptions:
Shapes simplified by taylor series expansion (Both shapes represented by parabolas)
Surfaces are treated as half spaces
There is no friciton
Materials are purely elastic

The problem Hertz solved:
What normal pressure distribution can be applied to two half spaces so the total deflection in the normal direction is equal to the interferance between two parabolas: