Euclidean Constructions
Axioms

Euclid set out 5 common sense axioms plus 5 geometrical axioms.

The geometry axioms are:

1. There exists a line through points P and Q
2. Line segments can be extended
3. Circles exists
4. All right angles are congruent

Euclidean Constructions
Parallel Postulate

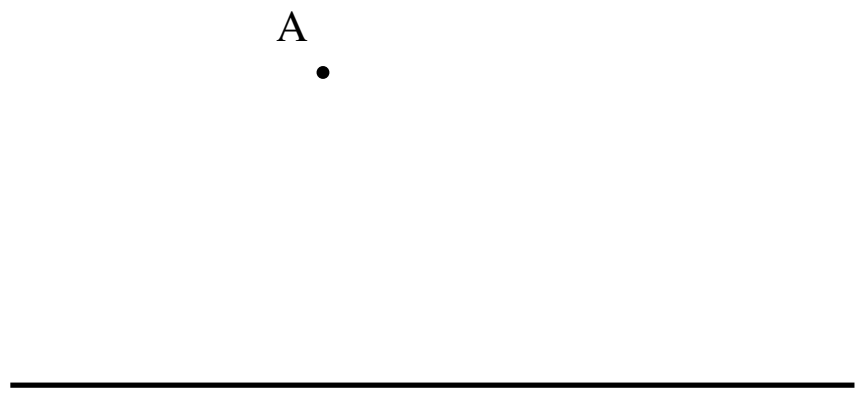
For every line ℓ and point P that does not lie on ℓ, there exists a unique line m through P and parallel to ℓ.

Euclidean Constructions

Construction 1: Perpendicular bisector

Euclidean Constructions

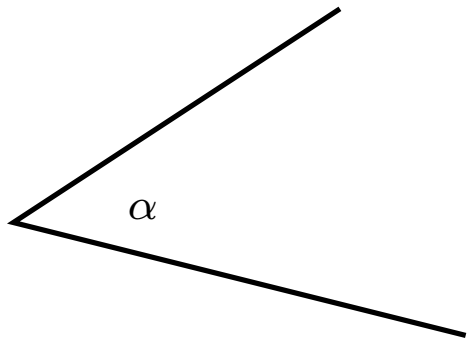
Construction 2: Perpendicular through a point

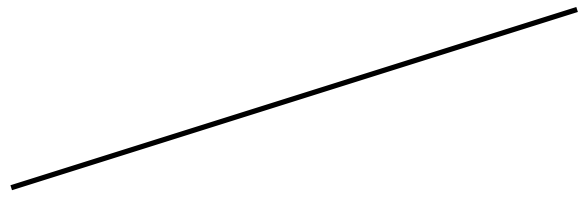


Euclidean Constructions

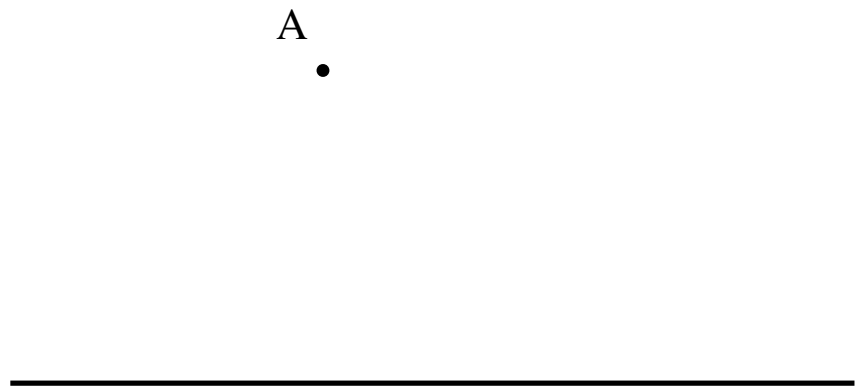
Construction 2: Perpendicular through a point

Euclidean Constructions
Construction 3: Duplicate an angle



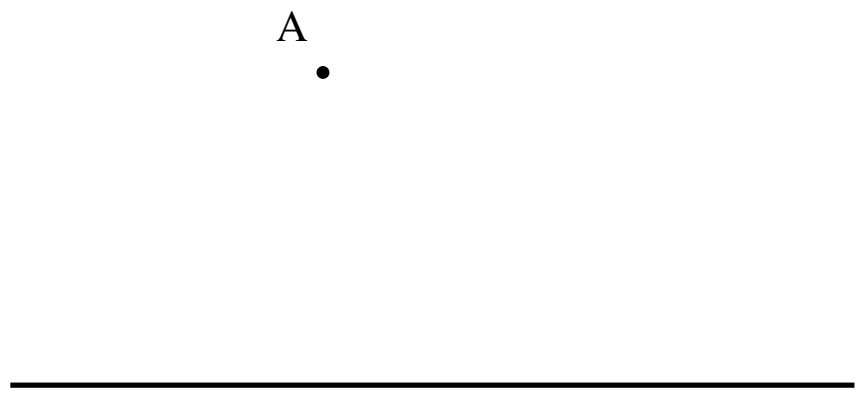


Euclidean Constructions
Construction 4: Parallel lines



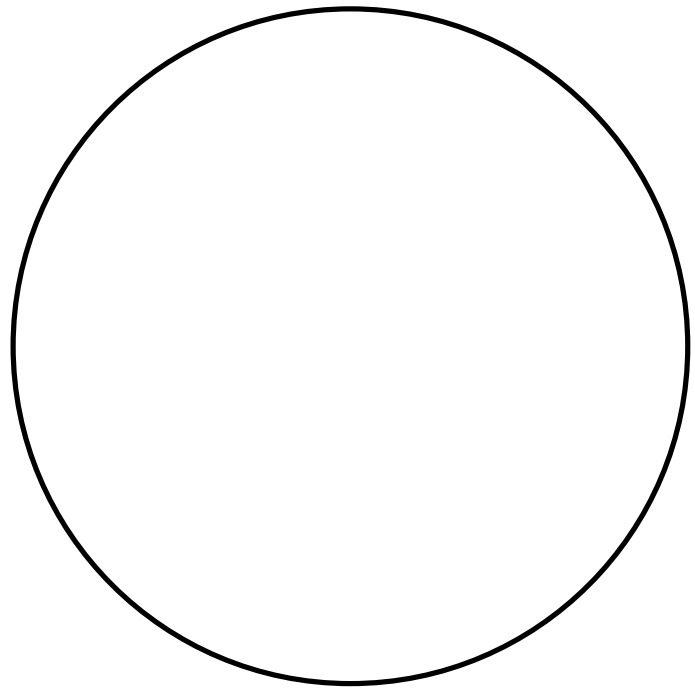
Euclidean Constructions

Construction 4: Parallel lines (alternate construction)

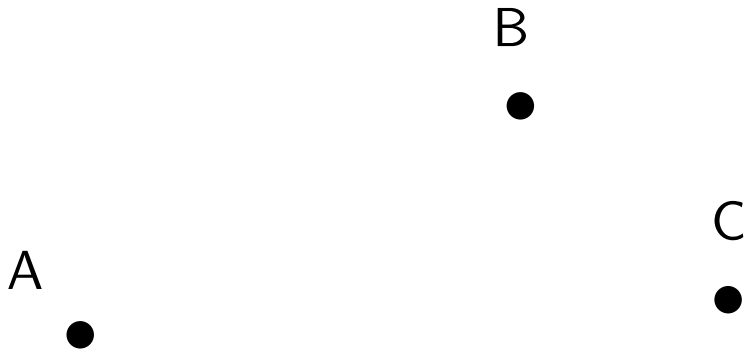


Euclidean Constructions

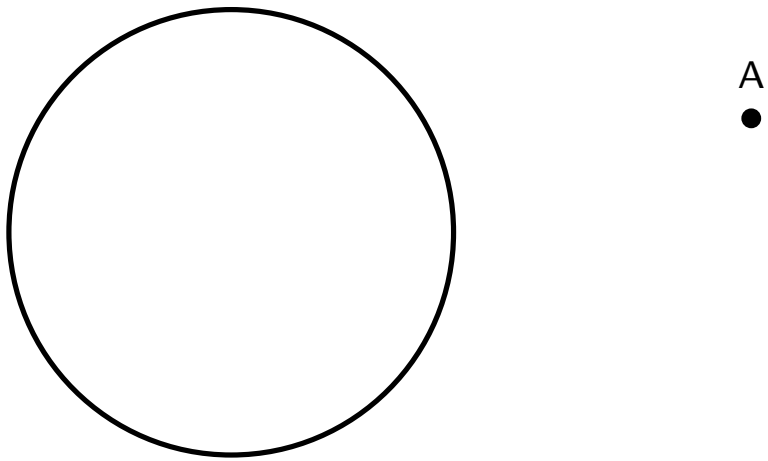
Construction 5: Center of a circle



Euclidean Constructions
Construction 5: Center of a circle



Euclidean Constructions
Construction 6: Touching circles



Euclidean Constructions

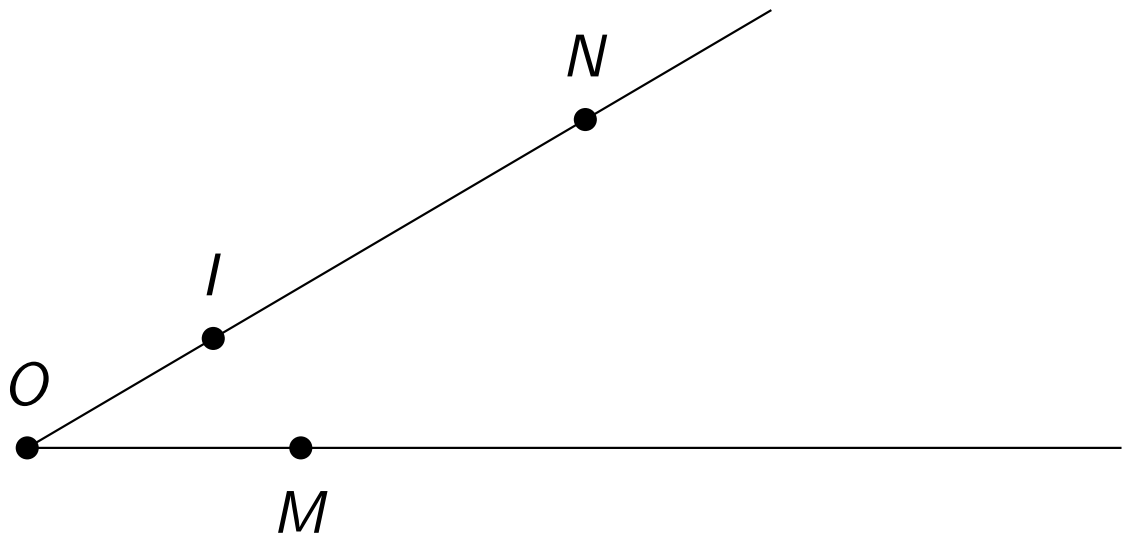
Construction 7: Dividing a line segment into equal parts

Euclidean Constructions
Construction 8: Multiplication of numbers

1 ———————

m ———————

n ———————————————



Euclidean Constructions
3 unsolvable problems

Squaring the Circle

Doubling the Cube

Trisecting an Angle