

Euclidean Constructions

Axioms

5 common sense axioms plus 5 geometrical axioms:

1. There exists a line through points P and Q
2. Line segments can be extended
3. Circles exist
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

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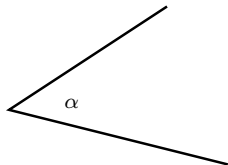
Euclidean Constructions

Construction 2: Perpendicular through a point



Euclidean Constructions

Construction 3: Duplicate an angle



Euclidean Constructions

Construction 4: Parallel lines

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Euclidean Constructions

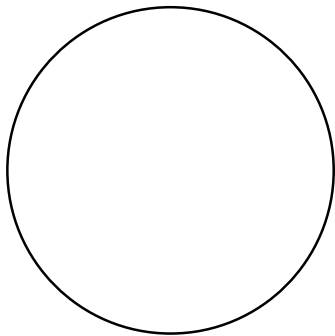
Construction 4: Parallel lines (alternate construction)

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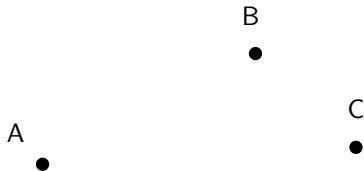
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Construction 5: Center of a circle



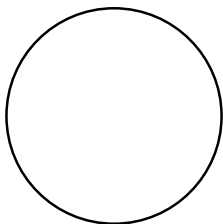
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Construction 5: Center of a circle



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Construction 6: Touching circles



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Construction 7: Dividing a line segment into equal parts



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Construction 8: Multiplication of numbers

1 ———

n —————

m —————

Euclidean Constructions

3 unsolvable problems

Squaring the Circle

Doubling the Cube

Trisecting an Angle