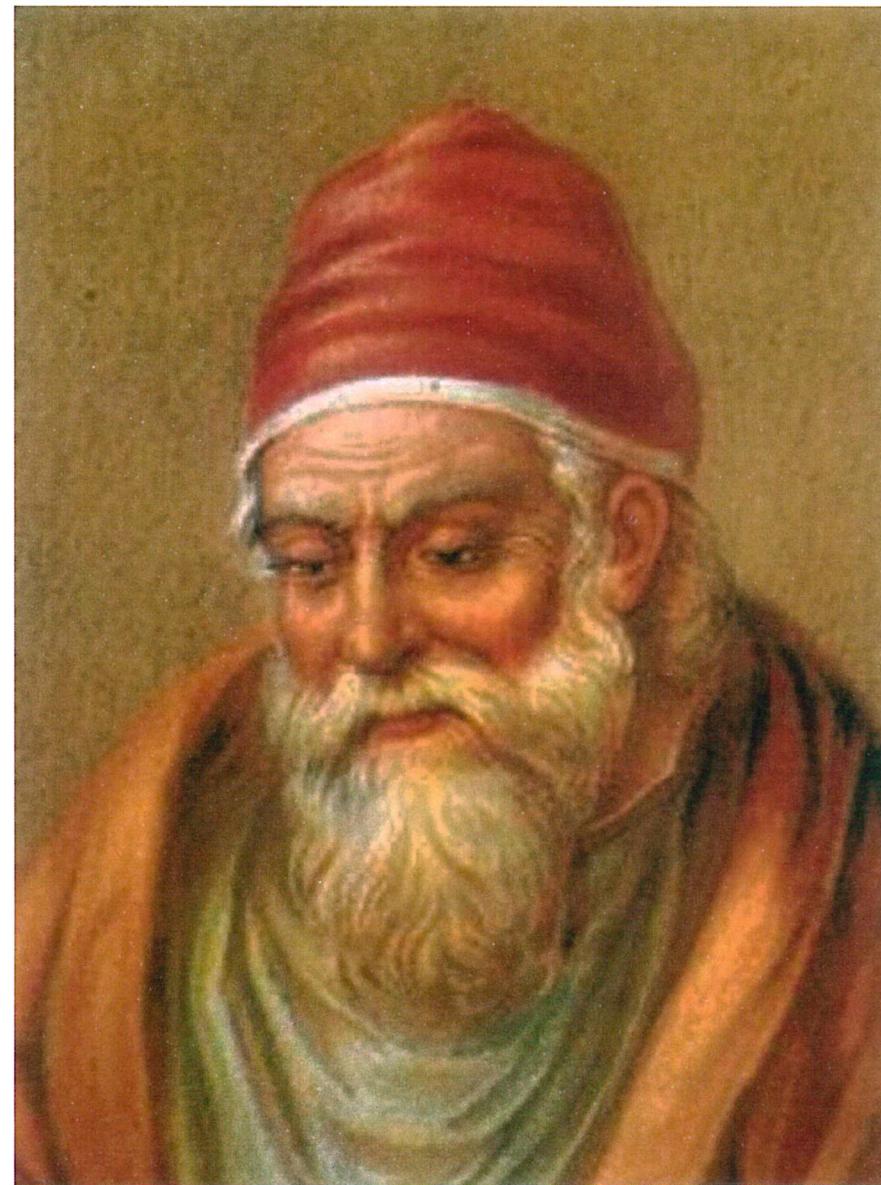


## Euclidean Constructions – Straight Edge & Compass



## 5 Common Sense Axioms

- Things that are equal to the same things are equal to one another.
- If equals be added to equals, the wholes are equal.
- If equals be subtracted from equals, the remainders are equal.
- Things that coincide with one another are equal to one another.
- The whole is greater than the part.

## 5 Geometrical Axioms (*Postulates*)

- There exists a line through distinct points  $P$  and  $Q$ .
- Line segments can be extended.
- Circles exist.
- All right angles are congruent.

## Parallel Postulate

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

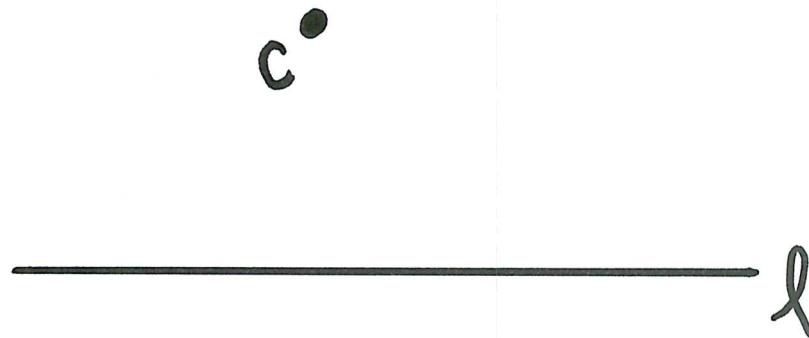
## Construction 1: Perpendicular Bisector

Given:  $AB$



## Construction 2: Perpendicular Through A Given Point

Given:  $l$  and  $C$

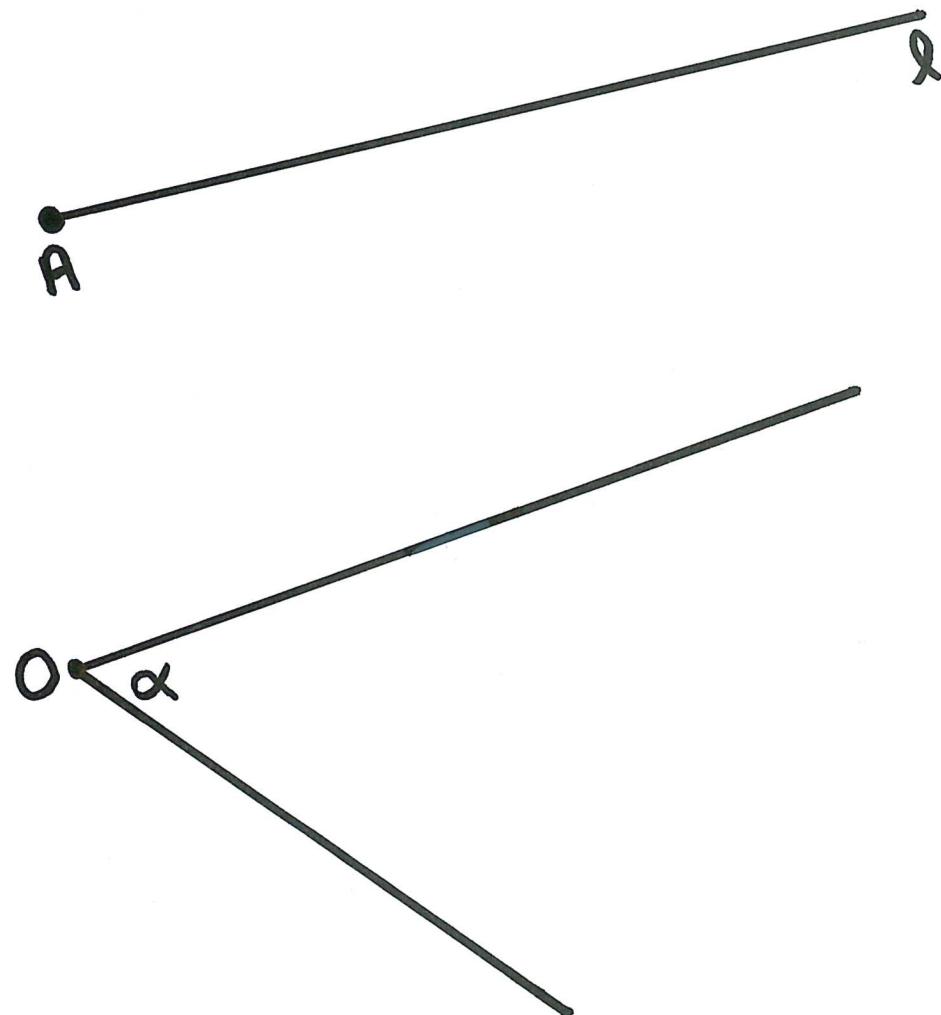


## Construction 2: Perpendicular Through A Given Point

Given:  $l$  and  $C$



## Construction 3: Duplicating An Angle Given: $\alpha, l, A$



## Construction 4: Drawing A Parallel Line

Given:  $l$  and  $A$

$A$  .



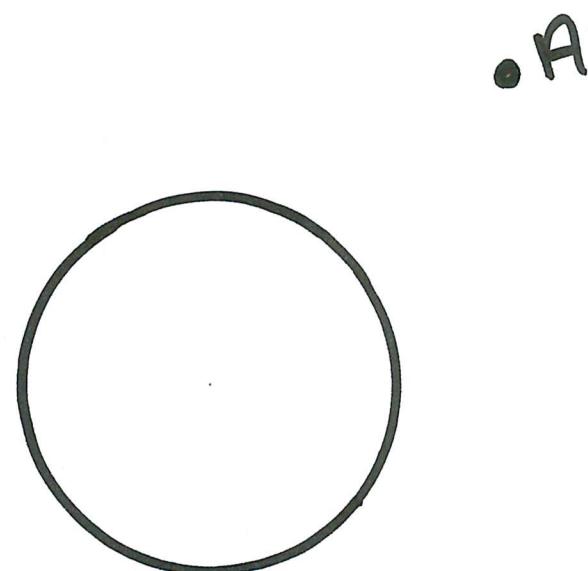
## Construction 5: Finding The Center Of A Partially Given Circle

Given: A, B, C  
(not on same line)



## Construction 6: Constructing A Circle Centered At A Given Point, Touching Another Circle

Given: Circle and A



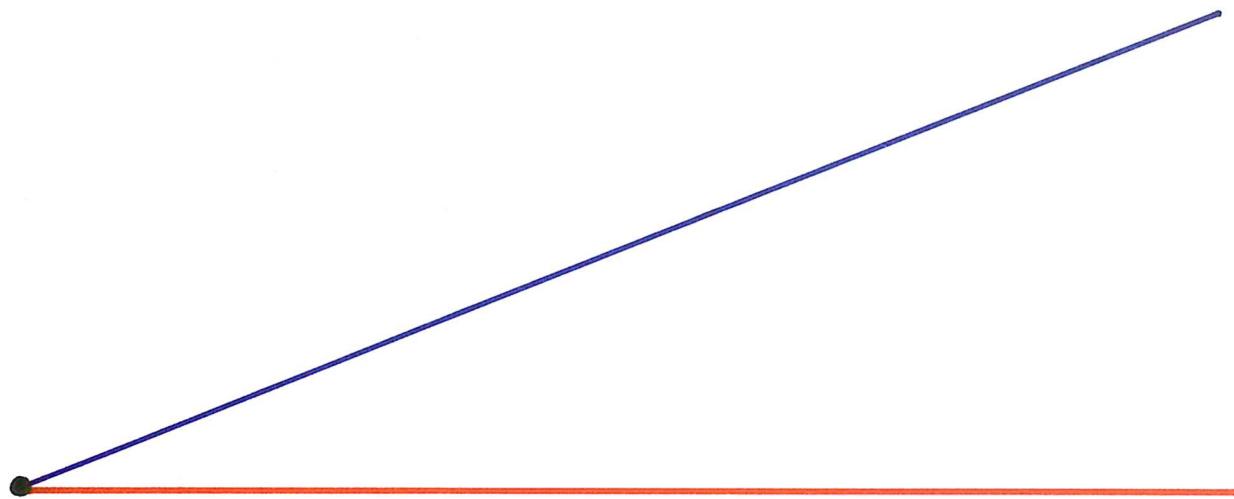
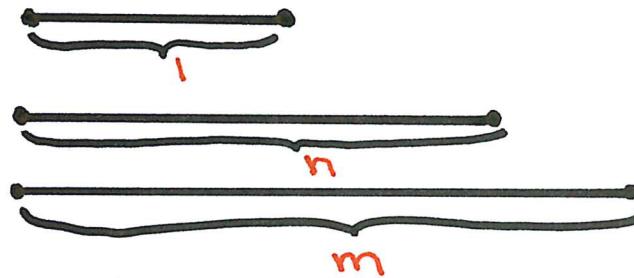
## Construction 7: Subdividing A Line Segment Into Equal Parts

Given: AB



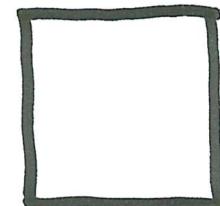
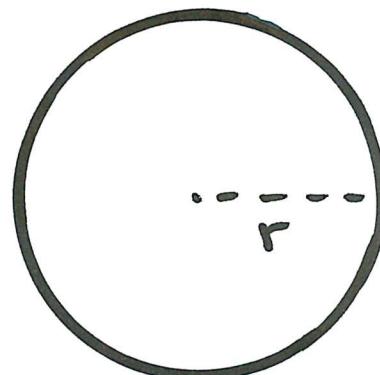
## Construction 8: Multiplication Of Numbers

Given:

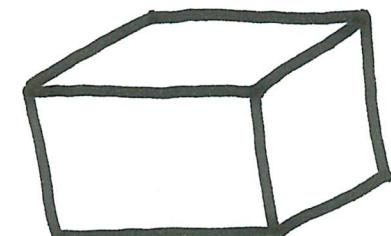
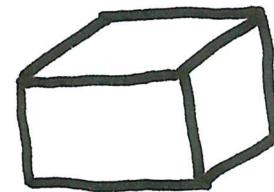


## Three Unsolvable Problems

- Squaring a Circle

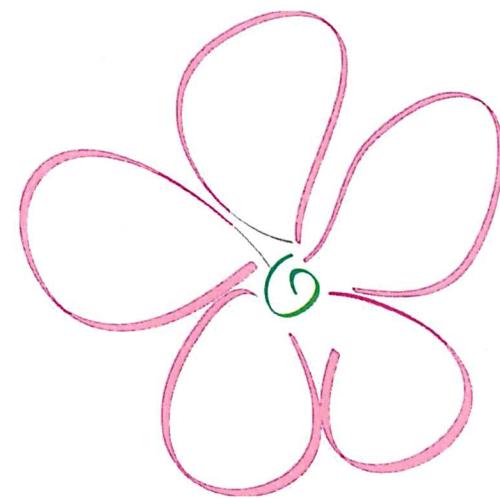


- Doubling a Cube



- Trisecting an Angle





QUESTIONS???