

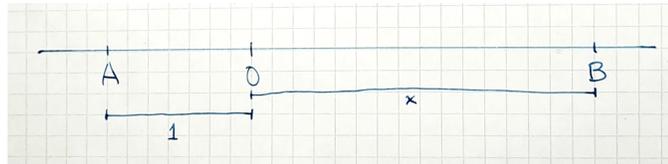
Week 3

Reading:

- *Geometry, Euclid and Beyond*: Finish section 1.3

Exercises/questions:

1. Start with a segment AB , with a point O contained in between A and B , so that OA has length 1. Let x be the length of OB , as set up in the following picture.

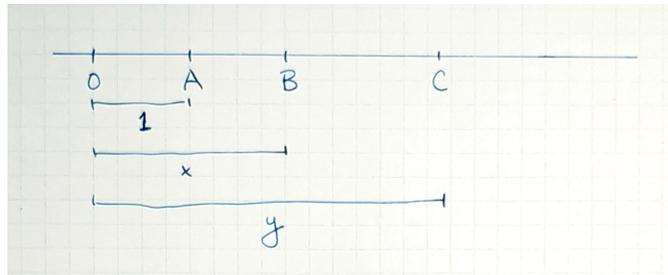


Consider the following construction:

- (i) Construct a semicircle whose diameter is AB .
- (ii) Construct the line perpendicular of AB at O . Let C be the intersection between this line and the semicircle.

Prove that the length of OC is \sqrt{x} .

2. Start with a line l_1 containing points (listed in order) O , A , B , and C such that OA has length 1. Denote the lengths of OB and OC by x and y , respectively, as shown below.



Consider the following constructions:

- (i) Draw a random line l_2 through O , not perpendicular to l_1 .
- (ii) Draw the line perpendicular to l_1 containing A , and let D be the intersection of this line with l_2 .
- (iii) Draw the line perpendicular to l_1 containing B , and let E be the intersection of this line with l_2 .
- (iv) Make the segment CD .
- (v) Construct the line parallel to CD containing E . Let F be the intersection of this line with l_1 .

Prove that the length of OF is xy .