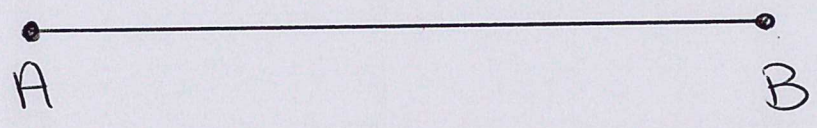


Construction 1: Bisecting a line segment  
and constructing a perpendicular.

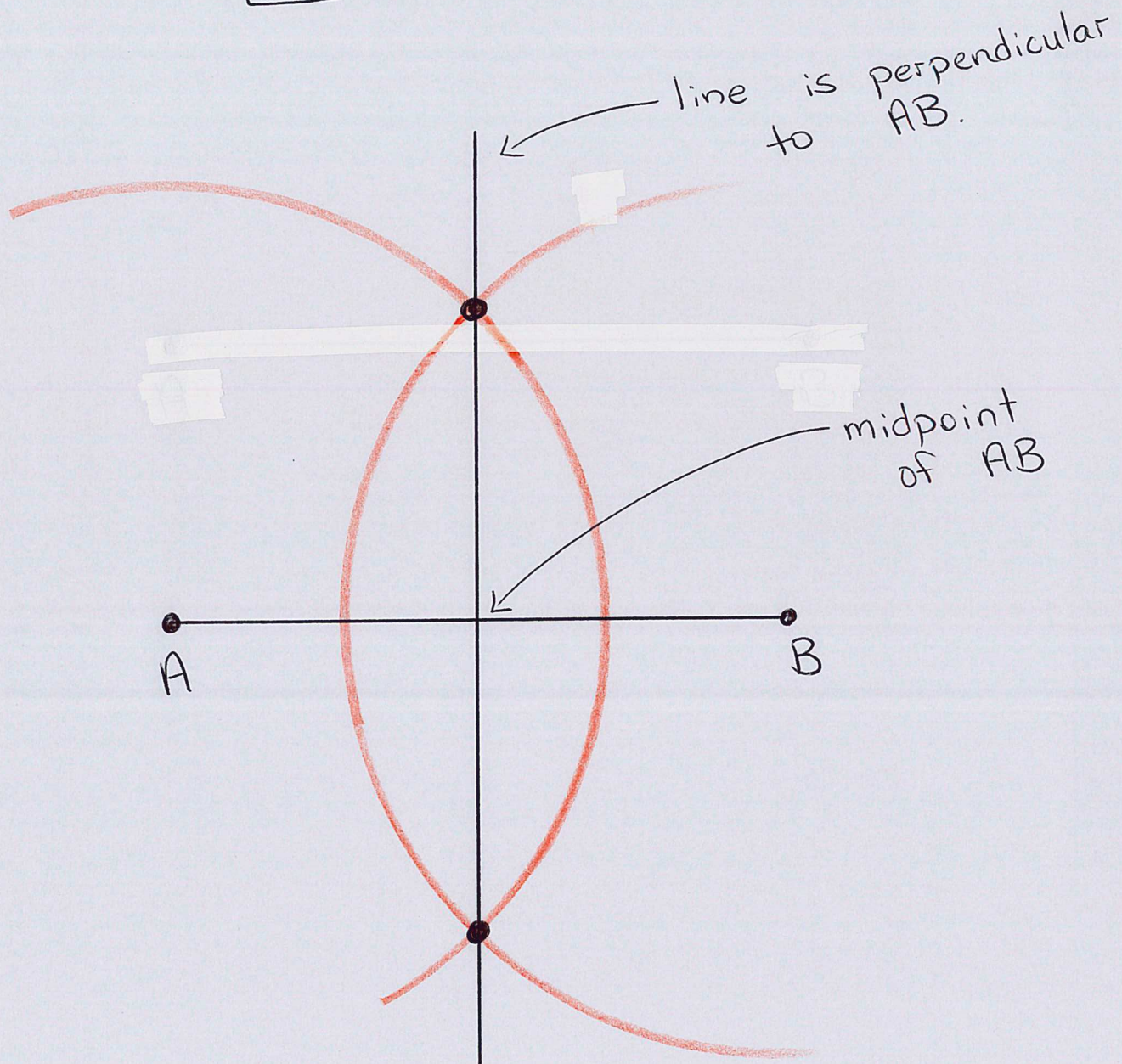
Given: AB



## Construction 1:

① Draw circle arc centered at A of some radius  $r$ .

② Draw circle arc centered at B of same radius  $r$ .

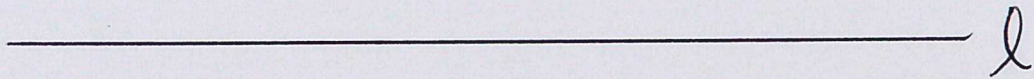


③ Join the two points of intersections from the arcs.

Construction 2: Constructing a Line  
Through a Given Point and Perpendicular  
to a Given Line

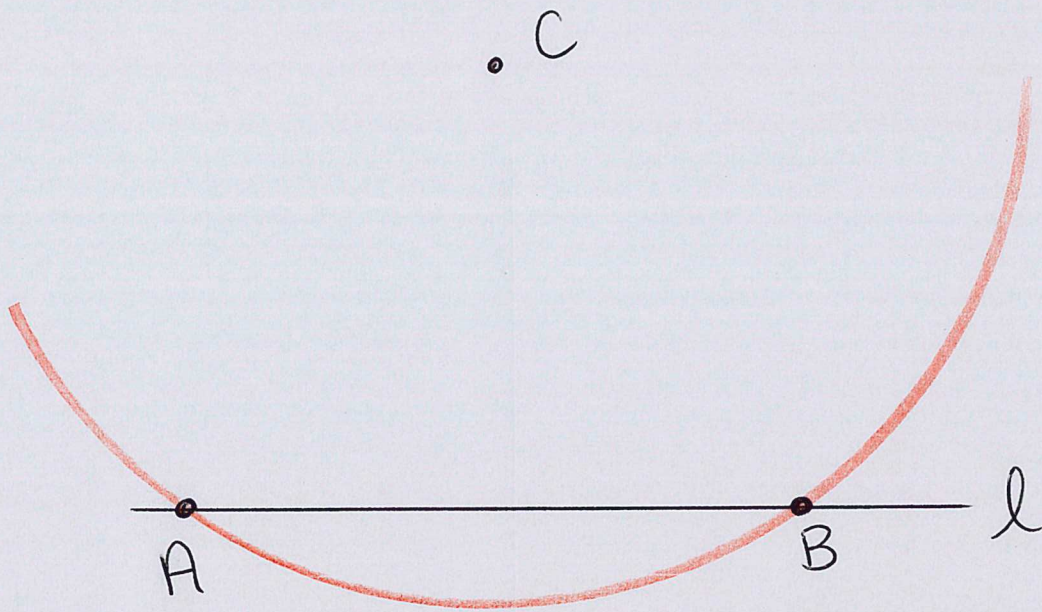
Given:  
C and l

• C



## Construction 2:

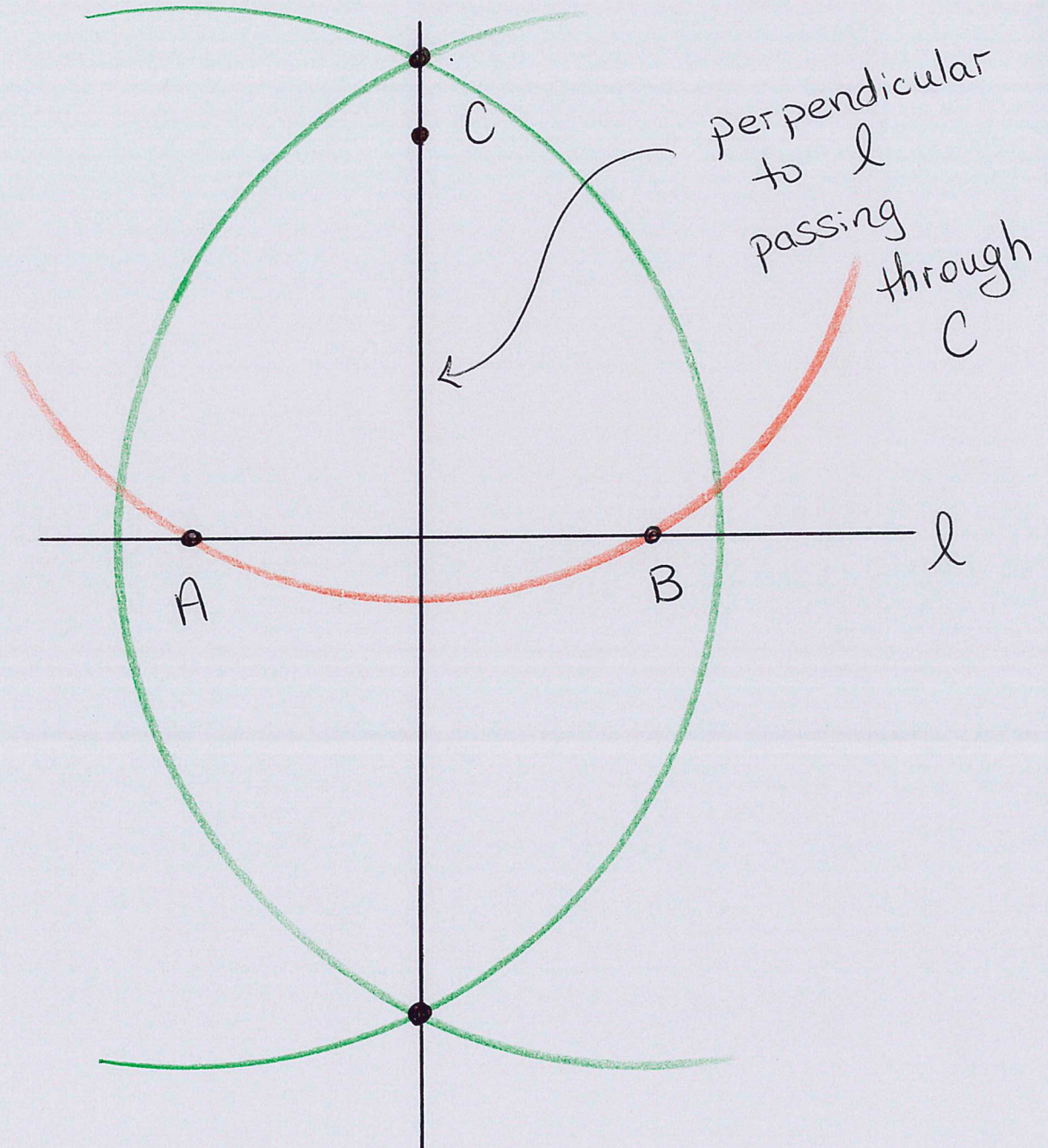
- ① Draw circle arc centered at  $C$   
(large enough to intersect  $l$ ) to get  
points of intersection  $A$  and  $B$ .



② Draw a perpendicular bisector of  $AB$  to get the perpendicular bisector of  $AB$ .

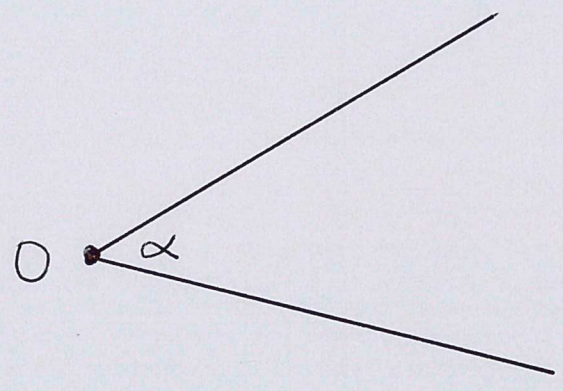
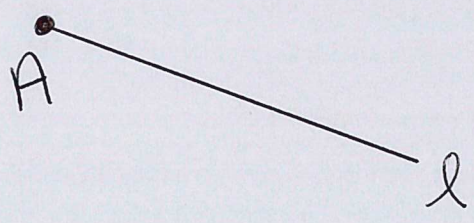
Construction 2:

② Repeat Construction 1 to bisect AB.



# Construction 3: Duplicating an Angle

Given:  $A, l, \alpha$



### Construction 3:

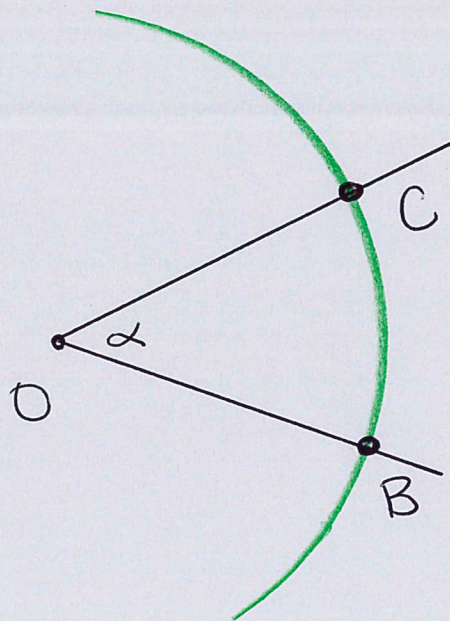
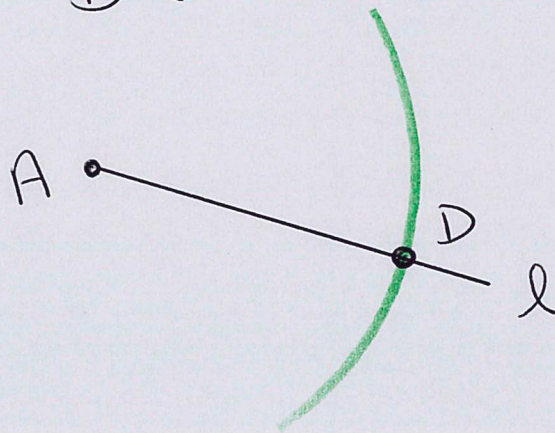
① Draw circle arc centered at  $O$   
of any radius  $r$

② Draw circle arc centered at  $A$   
with same radius  $r$ .

③ Identify intersection points

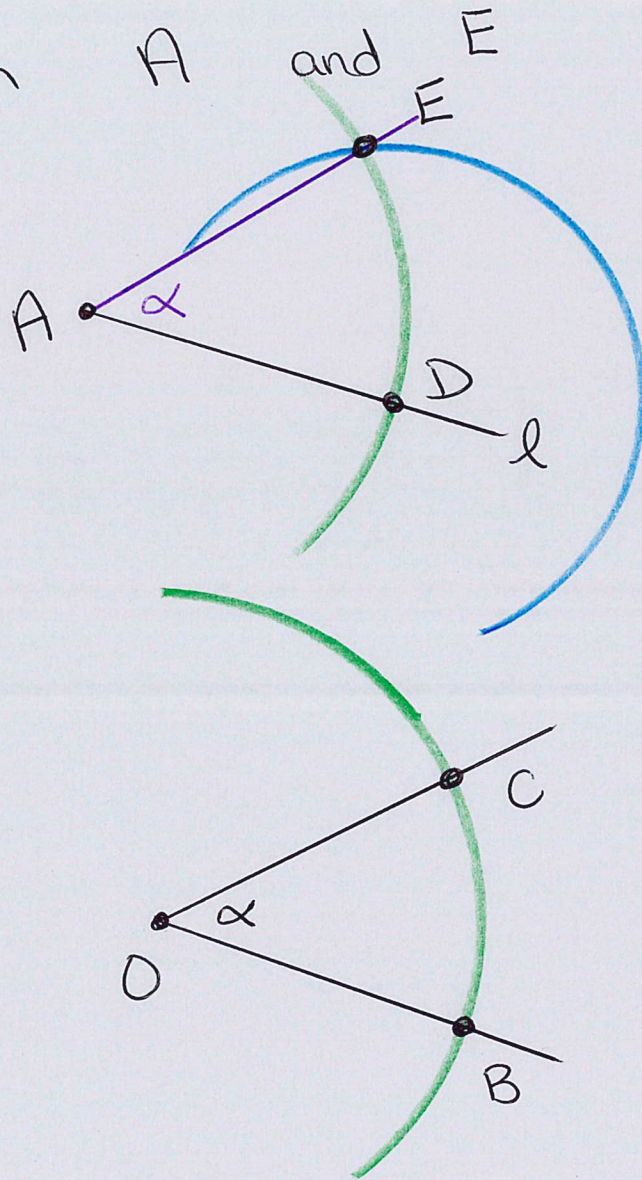
$B$  } "frame"  $\alpha$   
 $C$  }

$D$   $\leftarrow$  on second circle and  $l$



### Construction 3:

- ④ Measure  $BC$
- ⑤ Draw circle arc with center  $D$  and radius  $BC$
- ⑥ Identify intersection point  $E$  (of circles from steps 2 and 5)
- ⑦ Join  $A$  and  $E$





# Construction 4: Drawing a Parallel Line

Given : A and m

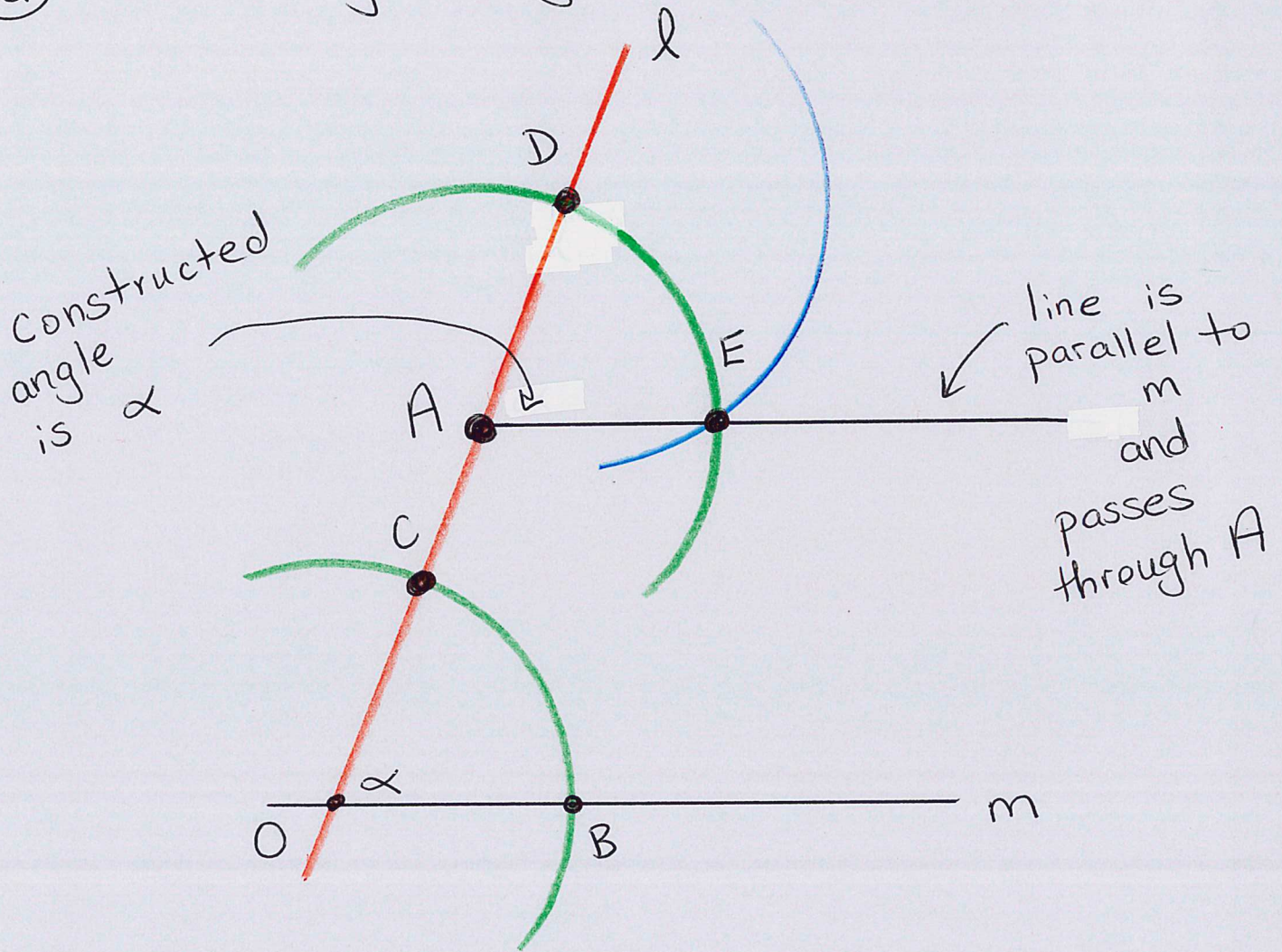
• A



Construction 4 :

① Draw any line through A intersecting m.

② Identify angle  $\alpha$  and line l.



③ Repeat Construction 3 to duplicate  $\alpha$  as shown above.

Construction 5: Finding The Center  
Of A Partially Given Circle

Given: A, B, C

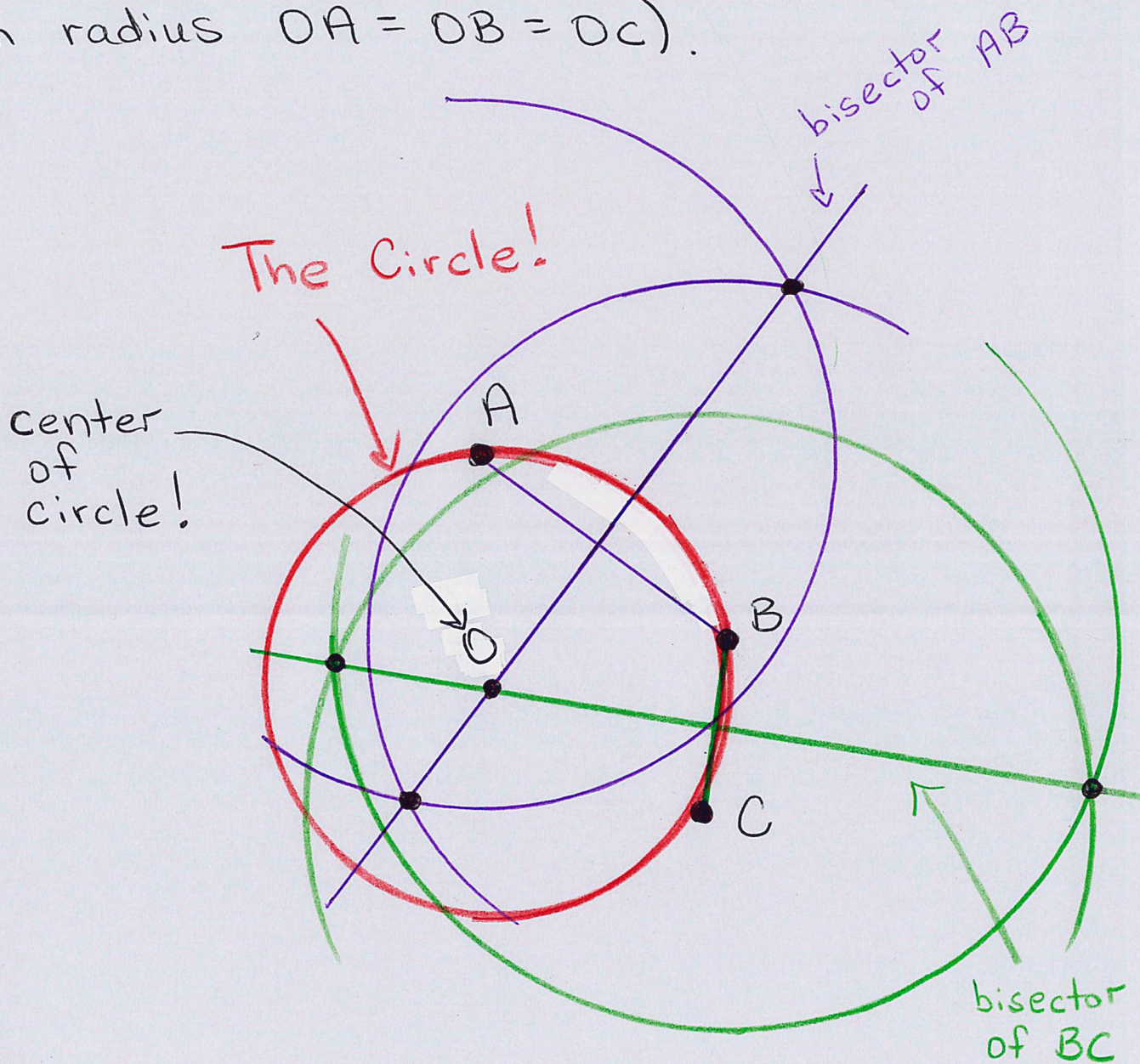
• A

• B

• C

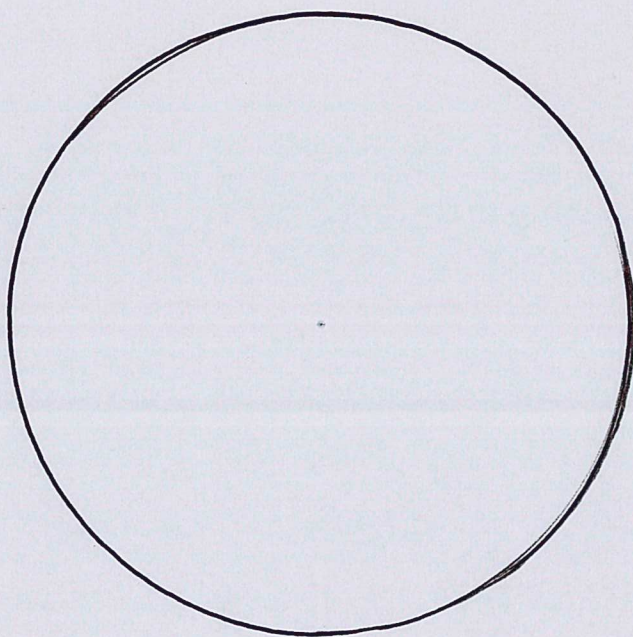
## Construction 5:

- ① Join A and B
- ② Join B and C
- ③ Bisect AB using Construction 1
- ④ Bisect BC using Construction 1
- ⑤ The bisecting lines from steps 3 and 4 intersect at a point; call this point O.
- ⑥ O is the center of the circle (with radius  $OA = OB = OC$ ).



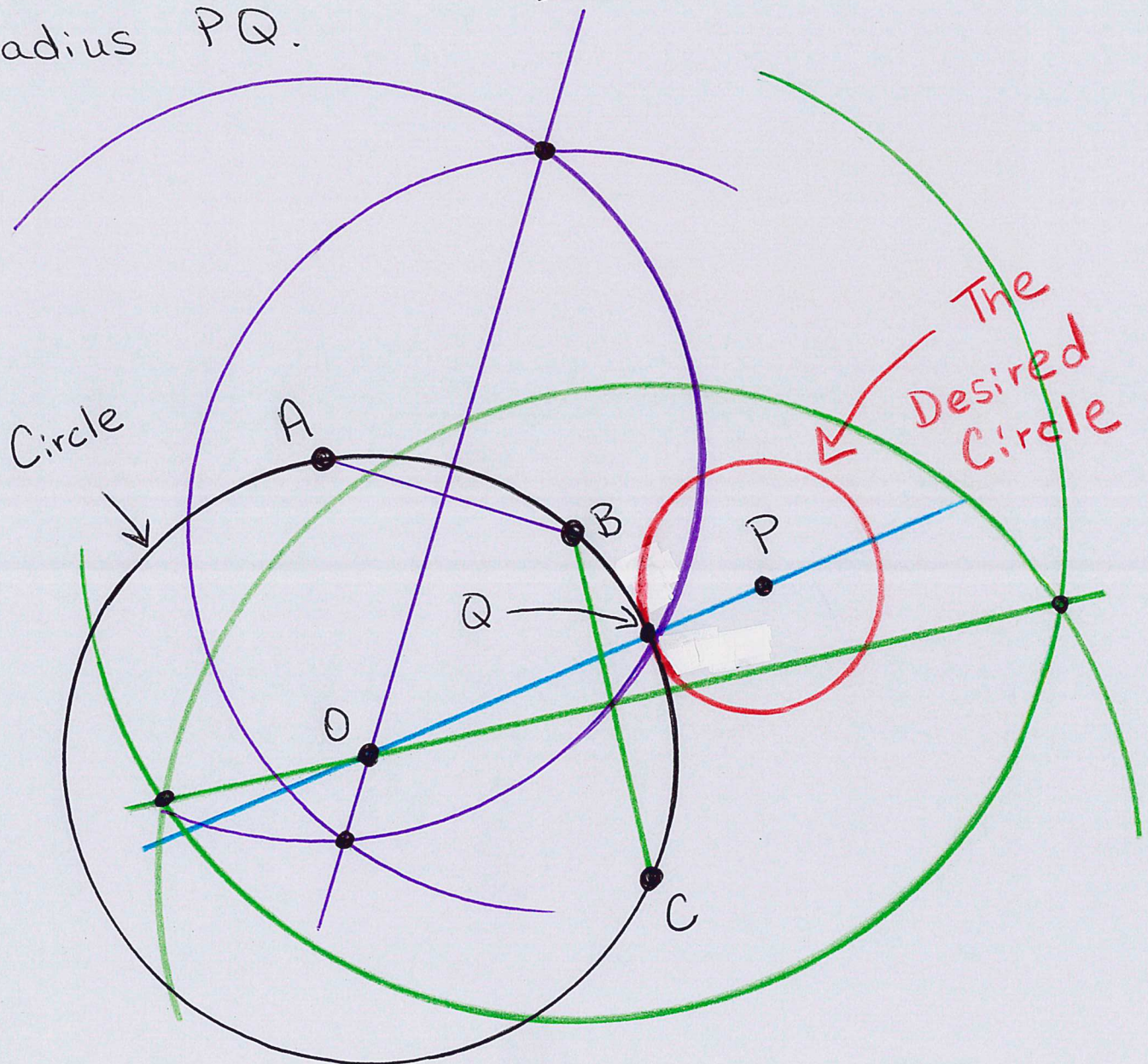
Construction 6: Constructing a Circle  
Centered at a Given Point and  
Touching Another Circle

Given: A Circle and P



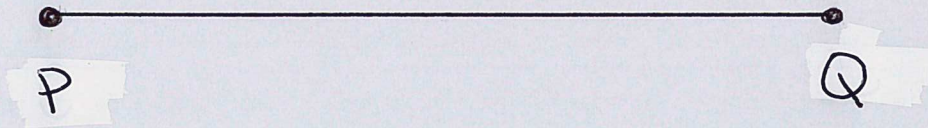
## Construction 6:

- ① Pick 3 points on the circle, say  $A, B, C$ .
- ② Use Construction 5 to find the center of the circle; call this  $O$ .
- ③ Join  $P$  and  $O$ .
- ④ Label the point of intersection of the circle and  $PO$  as point  $Q$ .
- ⑤ Measure  $PQ$ .
- ⑥ Draw the circle centered at  $P$  with radius  $PQ$ .



Construction 7 : Subdividing a Line Segment  
Into Equal Parts

Given : PQ



## Construction 7: (With 3 Equal Parts)

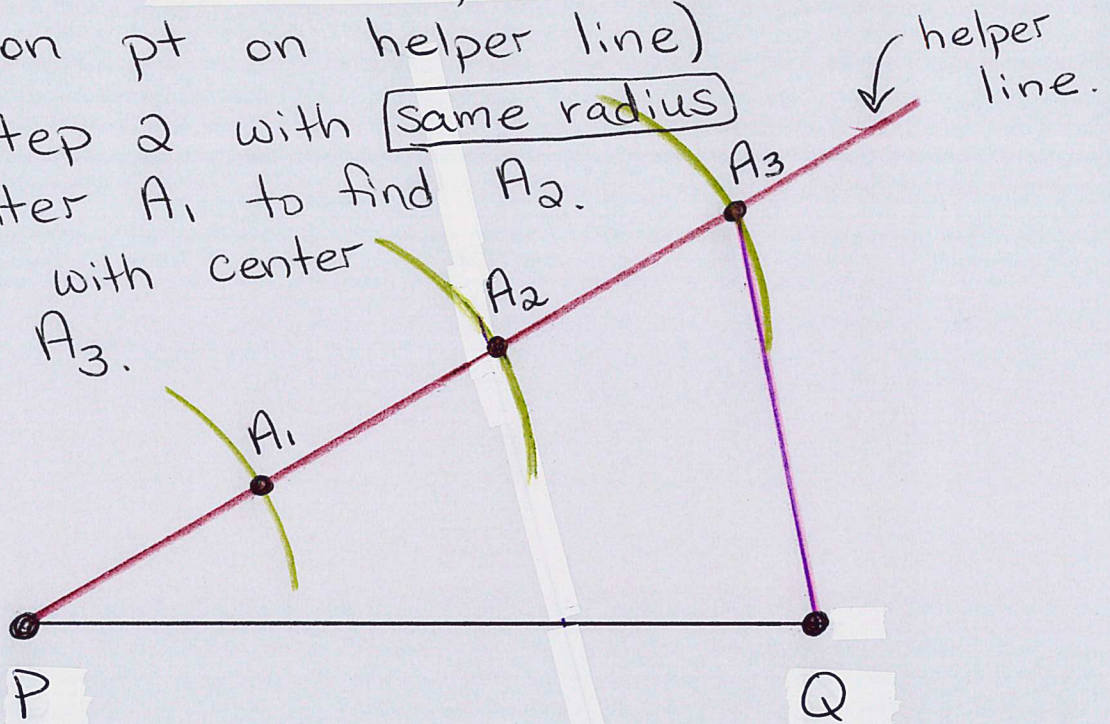
① Draw any line through P and not overlapping PQ. Call this your helper line.

② Using a compass opened up with a fixed radius  $r$ , centered at P, find point  $A_1$  (intersection pt on helper line)

③ Repeat Step 2 with same radius  $r$  but center  $A_1$  to find  $A_2$ .

Repeat again with center  $A_2$  to find  $A_3$ .

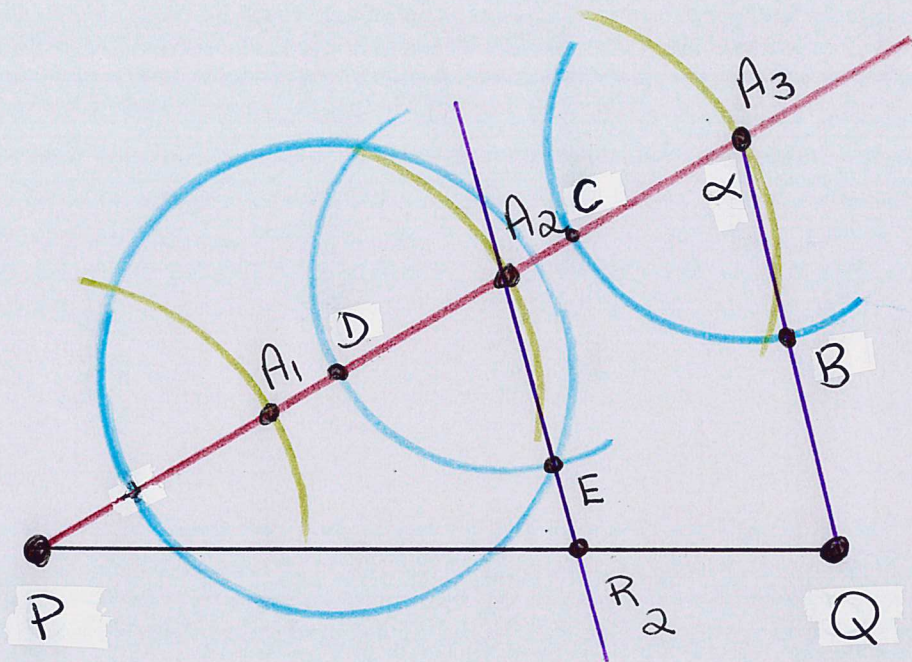
④ Connect  $A_3$  and Q.





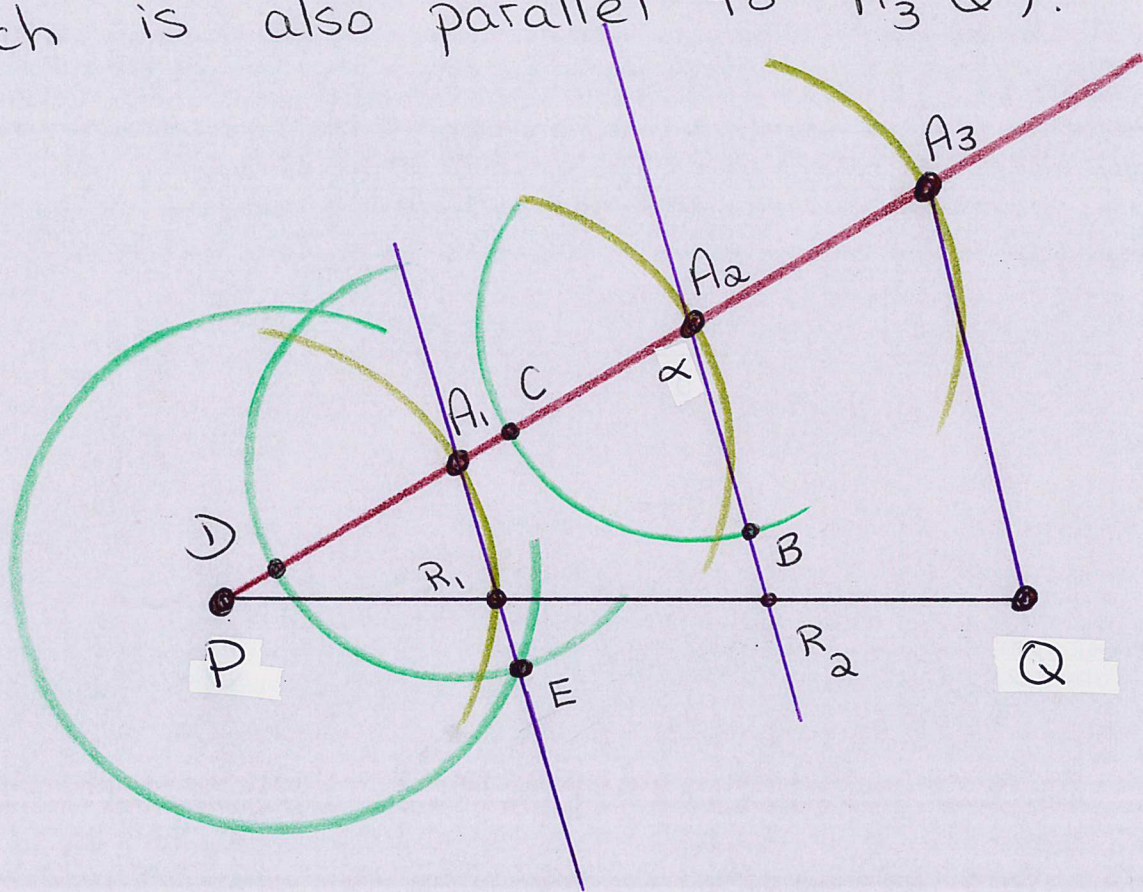
# Construction 7 (With 3 Equal Parts)

⑤ Use Construction 4 to draw a line through  $A_2$  and parallel to  $A_3Q$ .



## Construction 7 (With 3 Equal Parts)

⑥ Use Construction 4 to draw a line through  $A_1$  and parallel to the line constructed in Step 5 (which is also parallel to  $A_3Q$ ).

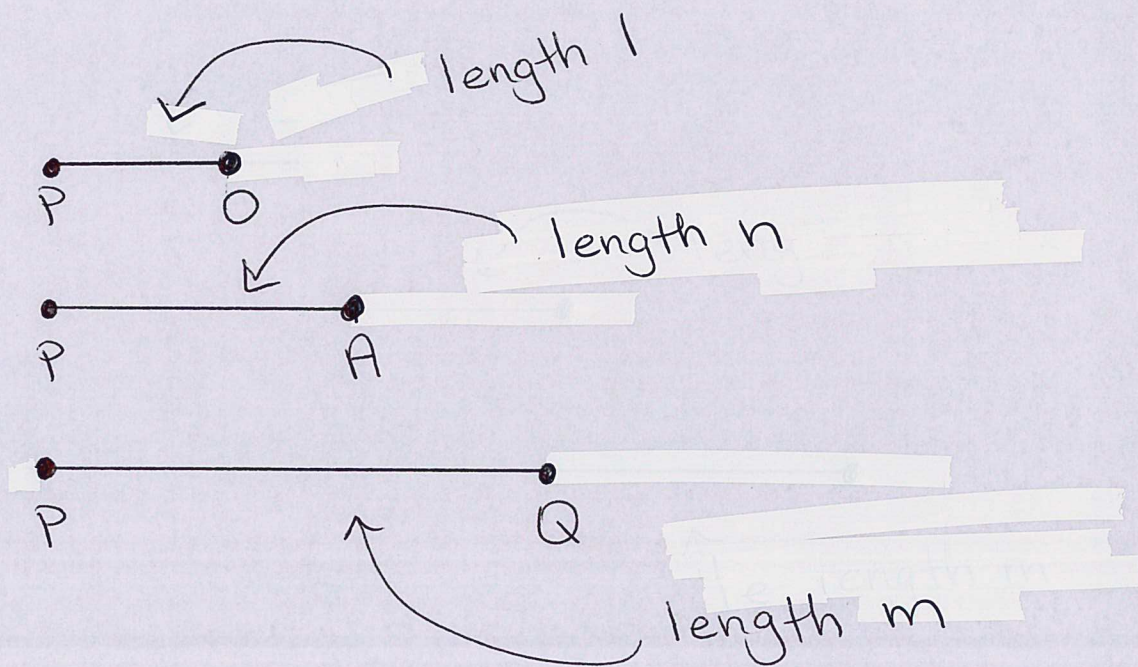


# Construction 8: Multiplication of Numbers

Given: Numbers  $l$ ,  $n$  and  $m$

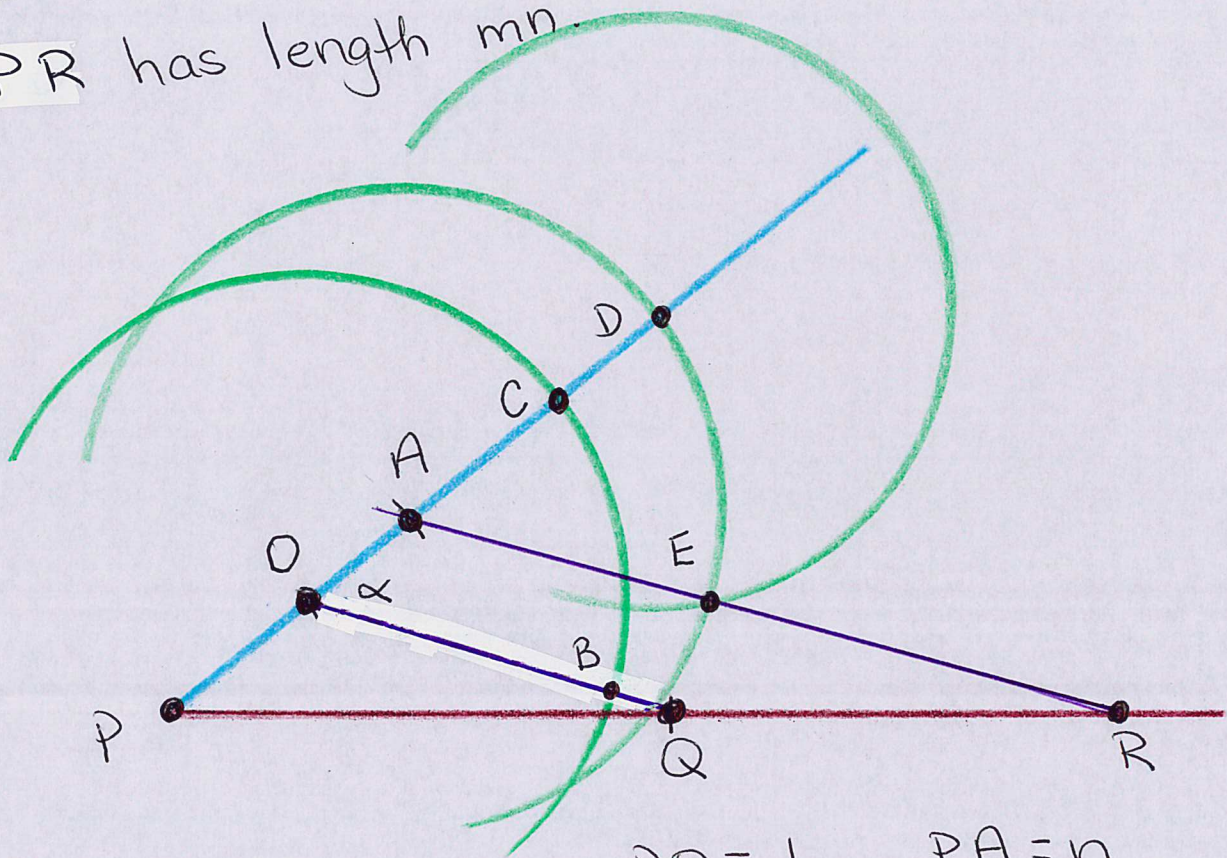
Line segment of length  $m$

Line segment of length  $n$



## Construction 8:

- ① Draw intersecting line segments with lengths  $PO=1$ ,  $PA=n$ ,  $PQ=m$  as shown below
- ② Connect points  $O$  and  $Q$
- ③ Use Construction 4 to draw a line through  $A$  and parallel to  $OQ$ .
- ④  $PR$  has length  $mn$ .



$$PO=1, \quad PA=n \\ PQ=m$$