
**CONSTRUCTION OF ANY ANGLE FROM 1° TO 360° WITHOUT BISECTION
('Lagsamladem Method)**

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ABSTRACT

Short cut in constructing angles from 1° to 360° as new development is having the capacities, such that if carefully and effectively used in our schools and colleges will go a very long way to improve the teaching/learning of the topic and enable students perform better in mathematics in both internal and external examinations. We still need to use ruler and a pair of compasses only, as usually directed by examination bodies, though with few of the old ideas, but totally side-track the ideas of bisecting some noted angles in order to obtain others. The fact that if you do not construct some angles and then bisect them you can not get the required ones and that only few angles can be constructed are totally erased. In this method, all angles are taking care of in the same way (equality for all angles constructions). Some angles with their diagrams are used as examples to demonstrate the method.

Keywords: Construction, Angles, Bisecting, Ruler, Pair of Compasses.

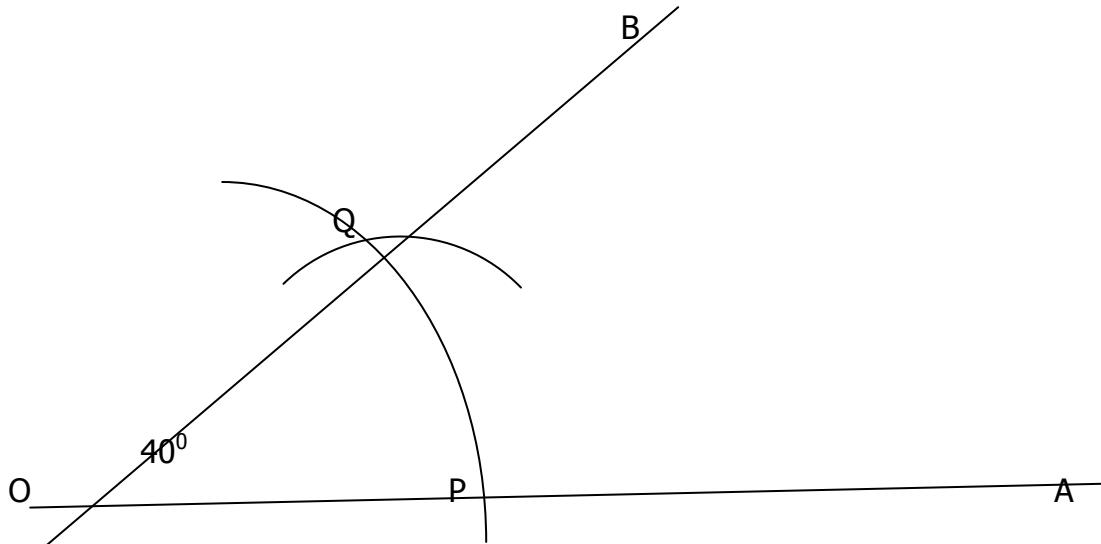
INTRODUCTION

The teaching and learning of angle construction has been taken in an uneasy way in our schools and colleges. However, construction is very useful in astronomy and navigation in particular and in all human endeavors in general. Despite all these laudable importance, many teachers do not teach construction in schools or do not teach it effectively. This is due to the fact that students may not grasp the ideas easily. This is what prompted the writer to search for a way that will make the teaching and learning of constructions in schools easier. The current method of constructing angles does not go beyond that of special angles i.e. 90° , 60° , 45° , and the bisections of these angles. For angles that cannot be derived from those above, all we need do is to draw. A student who was asked to construct angle 8° or 40° would find it difficult if not totally impossible, because none of the special angles can be bisected to give those angles. He would only draw, and this is no construction. As a result of this, the writer tries to produce an alternative way that will take care of all angles from 1° to any degree including the special angles, with the aid of a ruler and a pair of compasses only.

The 'Lagsamladem Method**Phase 1: (1° to 60°)**Steps:

- (1) Draw a line of any convenient length.
- (2) Measure 6cm or 60mm on your ruler with a pair of compasses.
- (3) Place the iron tip on one end of the line i.e. initial point O, and describe an arc to cut the line. Measure the required angle on your ruler with the compasses, noting that 1° is equivalent to 1mm, 10° is equivalent to 10mm, etc.

- (5) Place the iron tip on the intersection of the arc and the line and describe an arc to cut the former one.
- (6) Join the intersection of the arc with the initial point O.
- (7) Measure the angle with your protractor to confirm result.

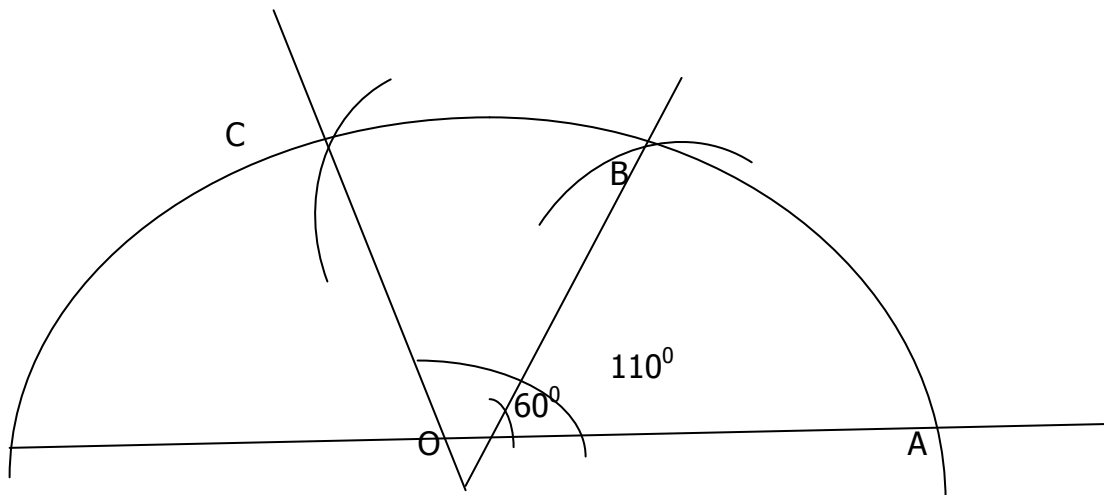


Line OP is 60mm, arc PQ is 40mm. Try this same methods for any angle between 1° to 60°

Phase2: (61° to 120°)

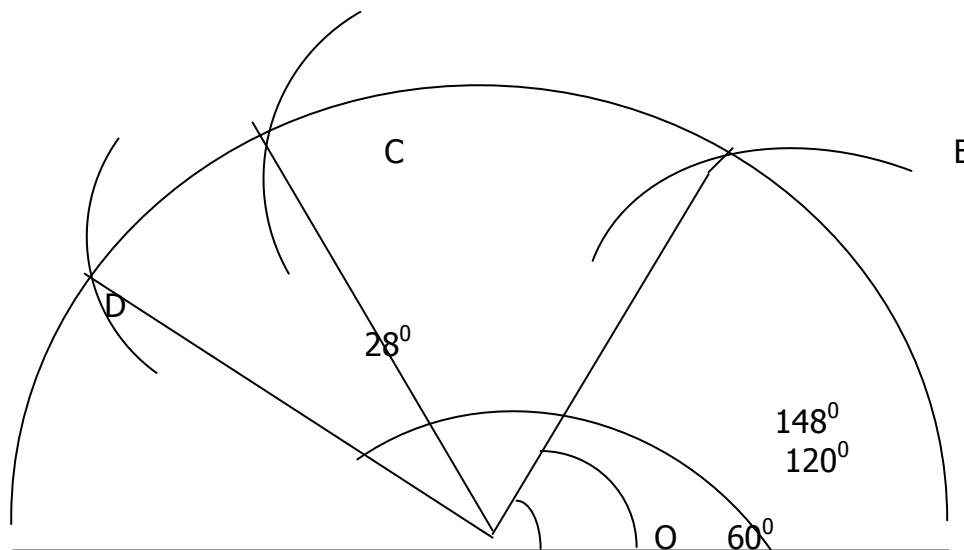
Steps:

- (1) Construct angle 60°, using the same steps as above.
- (2) Measure the remaining angle on your ruler with compasses e.g. for angle 110°, we need 50° more.
- (3) Place the iron tip on the intersection of the two arcs forming 60° and described an arc to cut the main arc. i.e. the first arc.
- (4) Join the point of intersection of the arcs with the initial point.
- (5) Measure the angle with protractor to confirm result.



Phase 3: (121° to 180°)

- (i) From the 60° already constructed, using the same rule, construct another 60° to make 120° as we normally do.
- (ii) Measure the remaining angle on your ruler with the compasses e.g to construct 145°, we need 25° more, measure 25mm on your ruler and describe an arc with the intersection of the arc forming 120° and main arc.
- (iii) Draw a line from the point of intersection of the new arc to the origin.
- (iv) Confirm result with your protractor.



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Phase 4: For other angles from 181° to 360° you only need to repeat the appropriate steps about and add to 180°, depending on the angle required. e.g. for angle 220°, draw a straight line, construct 40° as discussed above and add.

Observation/Challenge

Introduction and Application of the above method of angle construction in our secondary schools will go a long way to improve their understanding in constructions and thus, improve their performances in both internal and external examinations. In the same way, teachers will be interested in the teaching of constructions since the fear of learning difficulty of the students will be reduced, if not totally eradicated.

CONCLUSION

The method of constructing angles spelt above is very important for more understanding of the topic. However, we need to look at some constraints. Describing an arc whose radius is 60mm or 6cm may take a large space on our paper, and in this current situation we need to optimize our papers, or cost of papers or time etc. The task before us, is whether there is a

way to either minimize the radius or to look for a way of drawing to scale. In any case later research by the writer or the readers may give a clue to the problem ahead.

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