

Constructions of Angles without Using a Protractor

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Most students enjoy the topic of geometrical constructions using compass and ruler. When it comes to constructing specific angles, we consider only multiples of 15° . Students wonder: what about angles such as 10° , 20° , 40° and 50° ? Can we construct these too?

In this article, we consider this problem and offer an approximate procedure which yields angles that are reasonably close to the desired measure. So, the solution that we give is not exact.

It is assumed that the student knows: (i) how to construct a 60° angle, (ii) how to divide a line segment in a given ratio, using compass and ruler only.

Construction procedure

- Step 1. Construct a 60° angle AOB (with $OA = OB$) using compass and ruler. Join AB.
- Step 2. Find the points C and D of trisection of segment AB. So, $AC = CD = DB = AB/3$.
- Then angle AOC is almost exactly 20° and angle DOA is almost exactly 40° . The reader may check this out.

Questions for the reader

1. Why does this work? We leave it to the reader to work this out.
2. How can this procedure be modified to yield angles measuring 10° , 50° and 70° ?

Comment

Later in this issue, the editors have included a full analysis of this procedure.



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