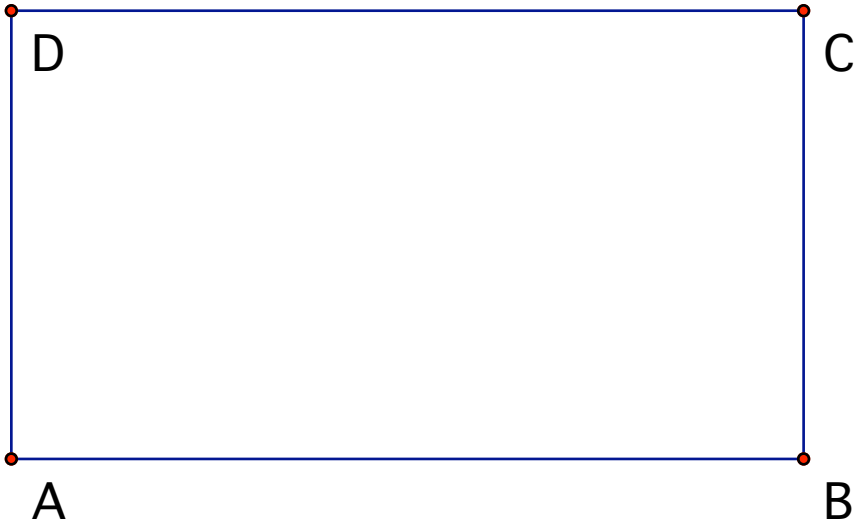
Construction Portfolio Part 3

Carry out these constructions, each one on a separate side of paper.

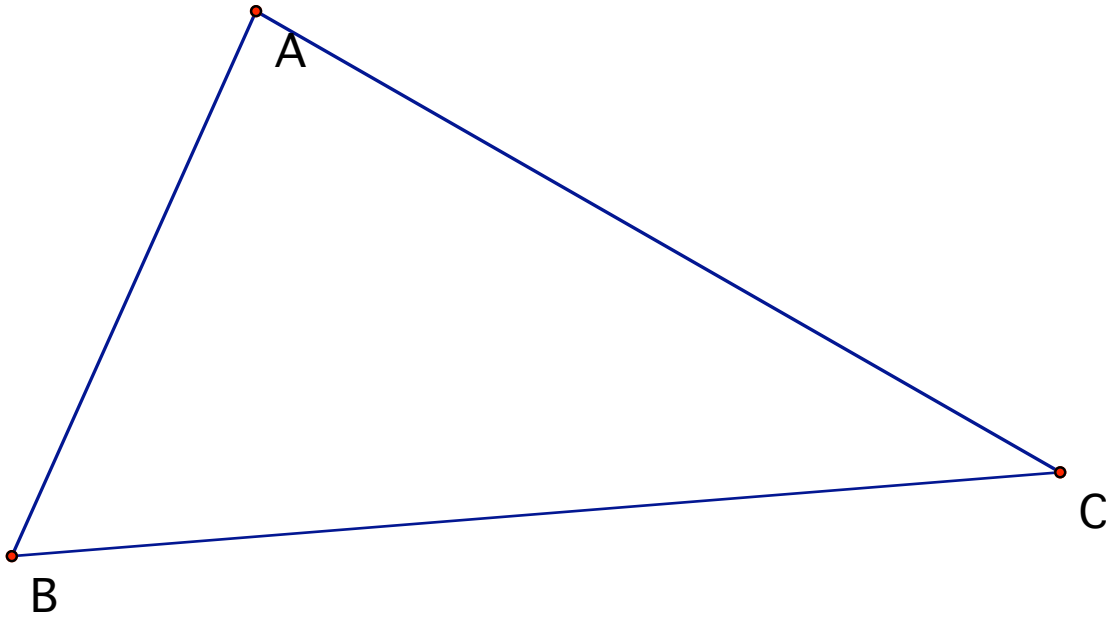
18: Square area equal to rectangle area

Construct a square whose area equals the area of rectangle ABCD.



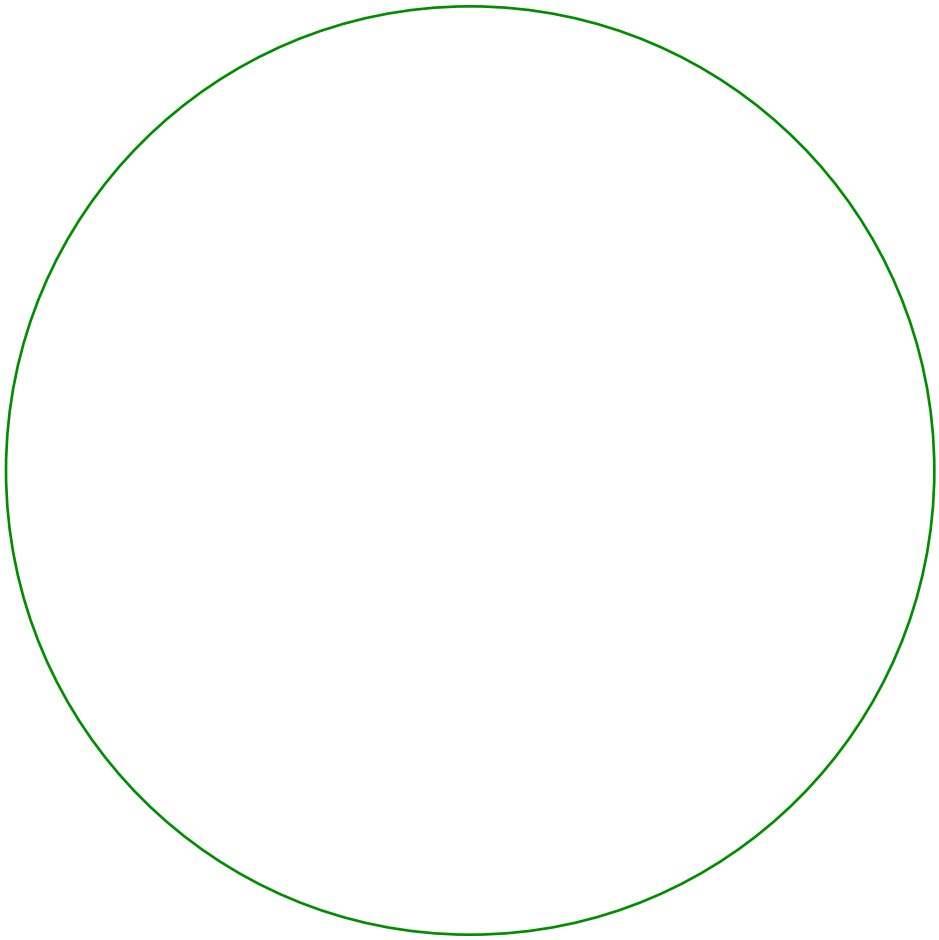
19: Medians and Centroid

Construct the 3 medians and the centroid of triangle ABC.



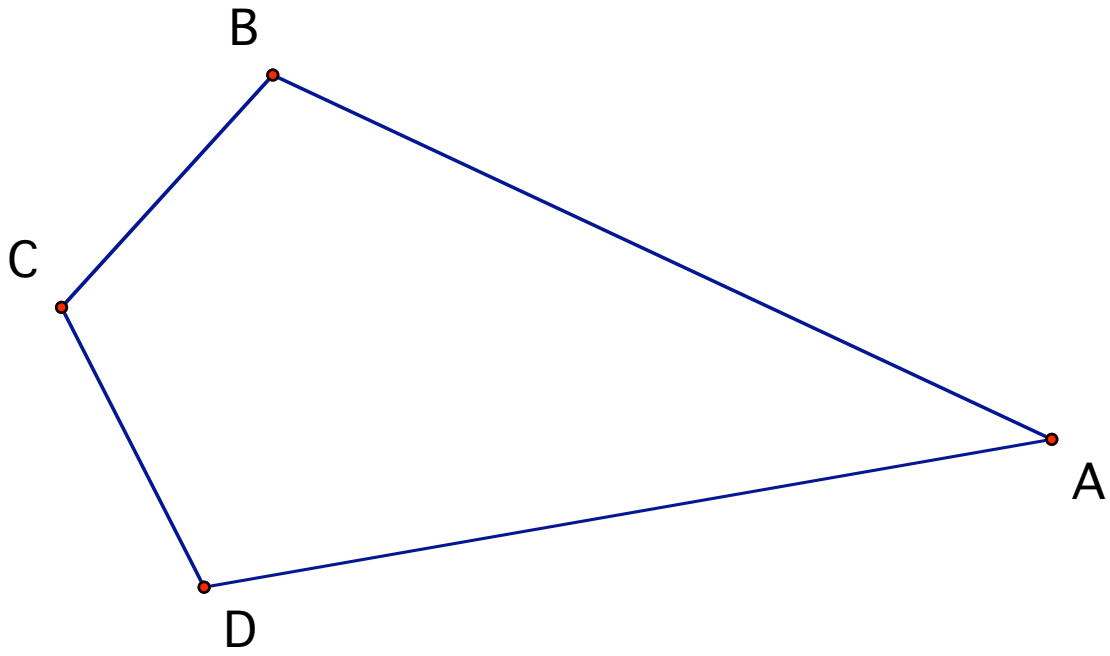
20: Inscribed Equilateral Triangle

Construct an equilateral triangle inscribed in this circle. (First, construct the center of the circle!)



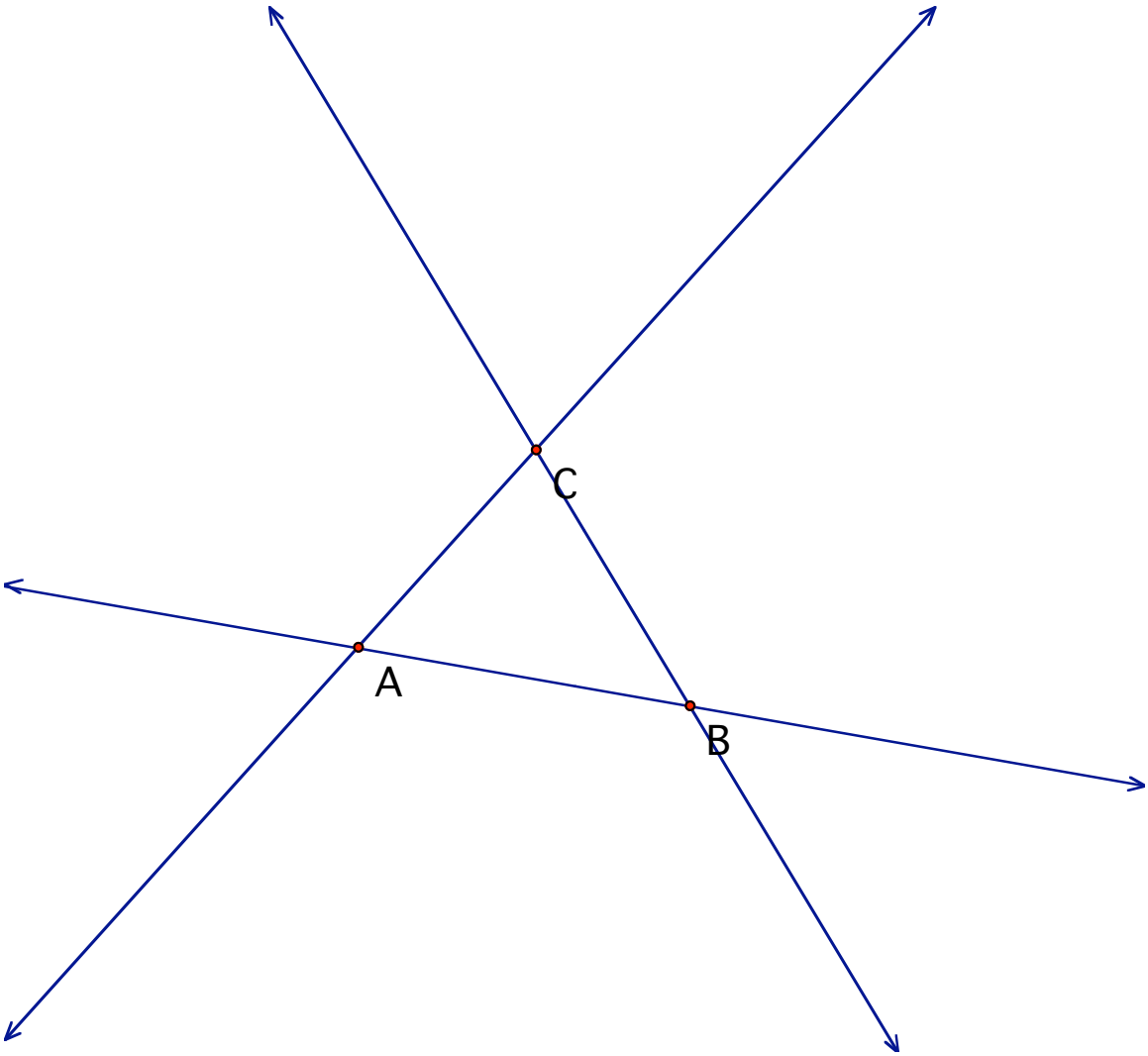
21: Inscribed Circle in Kite

Construct a circle inscribed in kite ABCD.



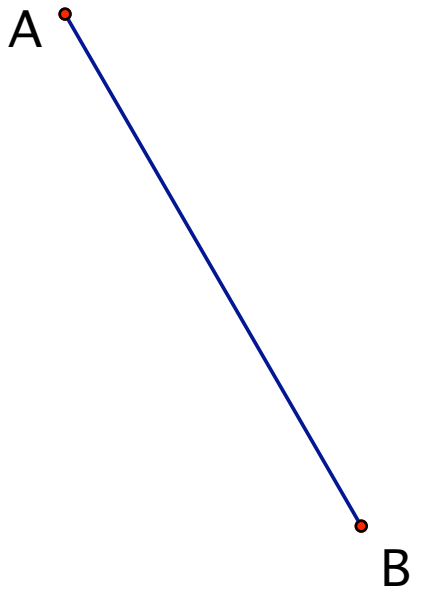
22: Incircles and Ecircles

Construct all 3 interior and all 3 exterior angle bisectors, then use these bisectors to construct the circle inscribed in triangle ABC and the 3 circles escribed in triangle ABC (i.e., all 4 circles are tangent to all 3 lines that are the extended sides of ABC).



23: Ratios internal and external

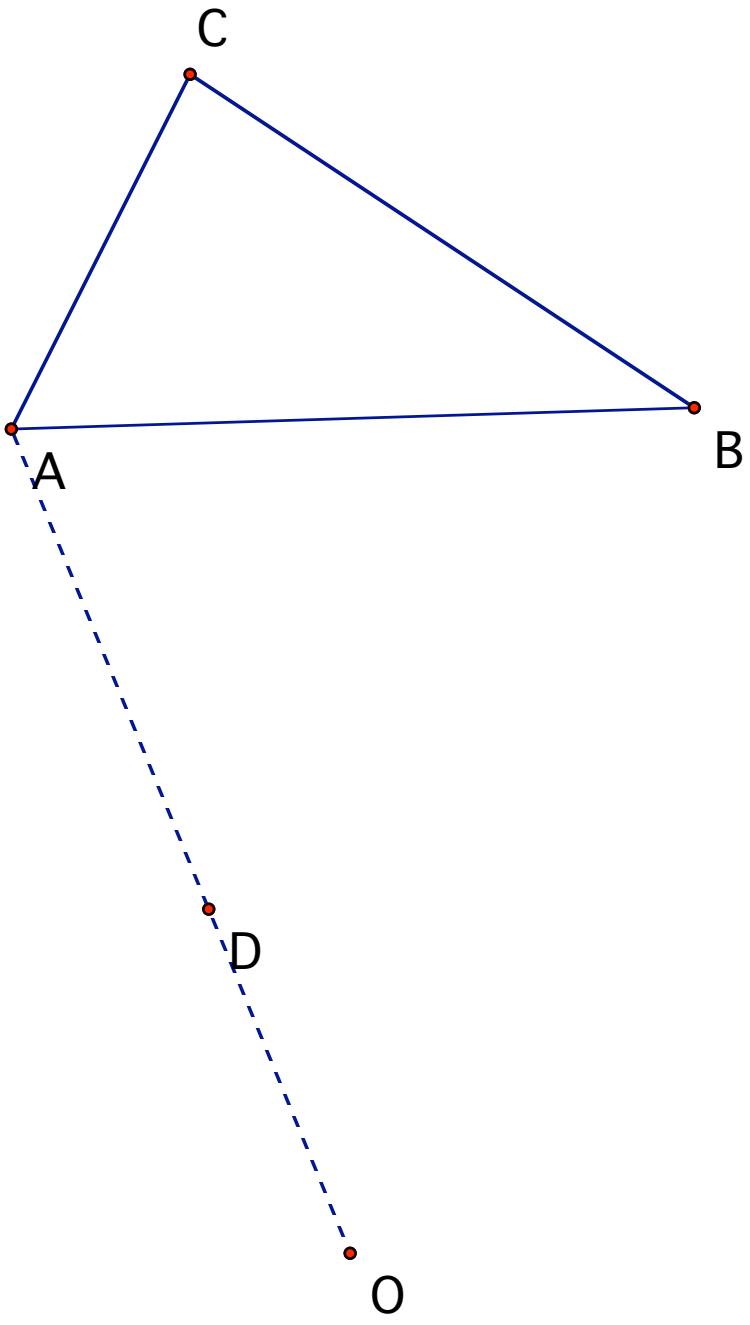
Divide AB internally and externally in the ratio 5:2, i.e., construct two points P and Q for which |AP/BP| = |AQ/BQ| = 5/2.



24: Dilation of Triangle

Construct points E on segment OB and F on segment OC so that these ratios are equal: OD/OA = OE/OB = OF/OC. Then draw segments for form triangle DEF.

This triangle DEF is the dilation of triangle ABC with center C and ratio OD/OA. Be sure to understand why triangle DEF is similar to triangle ABC.



25: Golden Rectangle

Given segment AB, construct C, D so that ABCD is a golden rectangle with longer side AB.

26: Regular Pentagon

Given segment AB, construct C, D, E so that ABCDE is a regular pentagon.