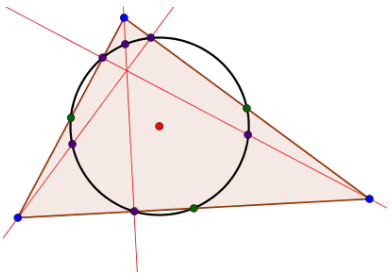
Euclidean Geometry:
An Introduction to Mathematical Work

Math 3600

Spring 2015



Regular Figures, especially the Pentagon

Read Book IV of the *Elements*. Pay particular attention to propositions 10-12.

15.1 Problem. Prepare a presentation of Euclid's construction of a regular pentagon.

15.2 Problem. Given a circle, but not its center, construct an inscribed equilateral triangle in as few steps as possible. (par 7)

15.3 Problem. Construct a square in as few steps as possible. (par 9)

15.4 Problem. Given a line segment AB, construct a regular pentagon having AB as a side. (par 11)

15.5 Problem. Given a circle Γ and its center O, construct inside Γ three equal circles, each one tangent to Γ and to the other two. (par 13)

15.6 Problem. Let ABC be an equilateral triangle inscribed in a circle. Let D and E be the midpoints of two sides, and extend segment DE to meet the circle at F so that E lies between D and F. Show that the rectangle on EF and DF has the same content as the square on DE.

15.7 Challenge. Construct a regular hexagon in as few steps as possible. What should the par value be?