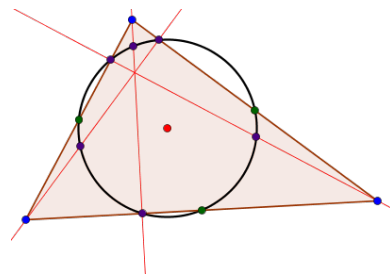


*Euclidean Geometry:
An Introduction to Mathematical Work*

Math 3600

Fall 2015

More Advanced Constructions



Definition. A circle is said to be *circumscribed* about a figure if the figure lies in the interior of the circle, except for the vertices which lie on the circle.

A circle is said to be *inscribed* in a figure if the circle lies in the interior of the figure and is tangent to each of the sides of the figure.

12.1 Challenge. Construct a circle inscribed in a given triangle ABC . (par 13)

12.2 Challenge. Construct a circle circumscribed about a given triangle ABC . (par 7)

12.3 Challenge. Given a line ℓ , a line segment d and a point O , construct a circle with center O that cuts off a segment from line ℓ which is congruent to d .

12.4 Challenge. Construct three circles such that each pair meets at right angles. (par 10)

12.5 Challenge. Given a segment d , a circle with center O and a point P inside the circle, construct a line through P on which the circle cuts off a segment congruent to d .

When exactly is this construction possible?

12.6 Challenge. Given a segment AB and an angle α and given another segment d , construct a triangle ABC with base equal to AB , angle α at C and such that $AC + CB = d$.

Exactly how often is this construction possible? How many ways can the conditions be met?

12.7 Challenge. Given two circles Γ and Γ' with centers O, O' , respectively, construct a line tangent to both circles.

How many such lines are there?