

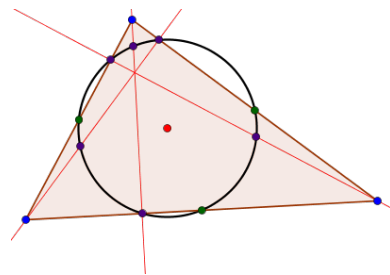
*Euclidean Geometry:  
An Introduction to Mathematical Work*

*Math 3600*

*Spring 2015*

*The Regular Pentagon Rides Again*

The next three problems concern the following construction template for inscribing a regular pentagon in a circle.



Given a circle with center  $O$ ,

1. Draw any line through  $O$ ; get  $A$  and  $B$ .
2. Draw  $\odot AB$ .
3. Draw  $\odot BA$ , get  $C$  as intersection of last two circles.
4. Draw line  $OC$ , get  $D$  between  $O$ ,  $C$  as intersection with given circle.
5. Draw  $\odot DO$ , get  $E, F$  as intersections with given circle.
6. Draw  $EF$ , get  $G$  as intersection with  $OC$ .
7. Draw circle  $\odot GA$ , get point  $H$  as intersection with ray  $DO$ .
8. Draw circle  $\odot A(OH)$ , get points  $I, J$  as intersections with given circle.
9. Draw circle  $\odot B(IJ)$ , get points  $K, L$  as intersections with the given circle.
10. (five steps) Draw segments  $BK, KJ, JI, IL, LB$ .

**16.1 Conjecture.** Triangle  $OAI$  is isosceles and its base angles are twice the angle at  $O$ .

**16.2 Conjecture.** Triangle  $BJI$  is isosceles and its base angles are twice the angle at  $B$ .

**16.3 Conjecture.** Show that  $BKJIL$  is a regular pentagon.