## MAT 4900: History of Mathematics

Name: $\qquad$

## End-of-term Exam

Due, with a signed cover sheet, by 1 p.m. on Friday, December 8, 2017. (Note: electronic signatures and submissions are acceptable and encouraged, but not required.)

You are expected to work on this exam alone and to refrain from talking about the exam to anyone except the professor until the time and date when it is due. You may use your own notes and any published materials that you like. (Cite sources appropriately.)

Your signature below attests to a pledge that you have done the exam according to the above instructions. (Attach this cover page to a printed copy of your solutions.)

Signature: $\qquad$
Solutions must be typeset in Tex.

1. Justify the following alternative method of trisecting an angle using the trisectrix (see Problem 4.7(c)). Let $\angle A O B$ be any central angle of a circle with center $O$ and radius $O A$. Let $A^{\prime}$ be the point of the circle diametrically opposite $A$. Construct the trisectrix for the circle with pole $A^{\prime}$, and let $C$ be the point at which ray $\overrightarrow{O B}$ intersects the trisectrix. Then $\angle A^{\prime} C B=\frac{1}{3} \angle A O B$.

2. Let $\alpha$ be the angle obtained by the Viète-Newton marked-straightedge construction for duplicating the cube, with $A B \cong C D$, as shown below. (See Problem 4.6(a) of the text.) For simplicity, assume $A B=1$.


Prove that, in the following figure, $A F=2$.


