

1096-VM-1988 **Ivko M Dimitric*** (ivko@psu.edu), 2201 University Drive, Lemont Furnace, PA 15456. *Two old geometrical chestnuts revisited*. Preliminary report.

We examine some variations and generalizations of one geometric problem of Fermat and another (well-known one) by Regiomontanus.

Fermat's geometric poser starts with a rectangle $ABCD$ (vertices labeled clockwise) with ratio of sides equal to $\sqrt{2}$. Construct upon longer side AB as diameter a semicircle on the outside and choose a point P on that semicircle. Consider intersecting points X and Y of PC and PD respectively with AB . To show is that $AX^2 + BY^2 = AB^2$. We generalize this statement for rectangles of different side ratio and examine what happens when the semicircle is replaced by another (quadratic) curve.

The classical problem of Regiomontanus asks to maximize the angle subtended at the eye of an observer moving directly towards a monument by that monument. We examine this problem for different curves of approach to the monument and positions of the monument. (Received September 17, 2013)