

HOMEWORK 6 - MATH 325

DUE DATE: Tuesday, April 8

INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 5 points. It is necessary to show your work.

GOOD LUCK!!

1. For a triangle ABC express the inradius r in terms of $s, s - a, s - b$ and $s - c$.
2. If a convex quadrangle with sides a, b, c and d is inscribed in a circle of radius R , its area K is given by

$$K^2 = \frac{(bc + ad)(ca + bd)(ab + cd)}{16R^2}.$$

3. If any point P in the plane of a rectangle $ABCD$ is joined to the four vertices, we have $PA^2 - PB^2 + PC^2 - PD^2 = 0$.
4. The outer and the inner Napoleon triangles have the same center.
5. The external bisectors of the three angles of a scalene triangle meet their respective opposite sides at three collinear points.
6. The internal bisectors of two angles of a scalene triangle, and the external bisector of the third angle, meet their respective opposite sides at three collinear points.