Worksheet - Nov. 22   MAT 3501   Fall 2016

1. If z_A, z_B, z_C are the complex numbers corresponding to three non-collinear points in the plane A, B, C, respectively, and G is the centroid of $\triangle ABC$, find a formula for z_G in terms of z_A, z_B, z_C.

2. Use complex numbers to prove the following theorem attributed to Napoleon Buonaparte: If three equilateral triangles are erected outwards on the sides of an arbitrary triangle, show that the centers of these equilateral triangles form another equilateral triangle. (Note: This is called the outer Napoleon triangle.)

3. Show the theorem in problem 2 remains true if "outwards" is replaced by "inwards". (Thus, there is also an inner Napoleon triangle.)

Happy Thanksgiving!