MA 341 Exam #3 Review
Exam #3 will be in class on Friday, November 16

1. Read and review the "Log of Class Activities" from the course website through Friday, November 9.

2. Read and review the relevant sections of the "Course Notes" from the course website. You are not responsible for the material that we did not cover. Section 6.6, including Problems 6.6.1–6.6.4, 6.6.6, 6.6.8. Section 7.1, including Problems 7.1.1–7.1.9. Section 7.2, including Problems 7.2.1–7.2.8, 7.2.10–7.2.13, 7.2.15–7.2.16. Section 7.3, including Problems 7.3.4 parts 1–5, 7.3.7–7.3.9. Section 7.4, including Slides 101–112, 117–120, 122, 128–136, 140–142.

3. Read and review all of the homework problems, including solutions posted on the course website.

4. In particular be able to do the following, and problems similar to the following. I may directly ask some questions just like these, but I may also ask related questions that are not exactly like these.

   (a) Be able to do all of the problems listed above.

   (b) Explain how to add, subtract, multiply, and divide complex numbers geometrically, as well as raise powers and find roots of complex numbers.

   (c) Use trigonometric identifies to justify the geometric description for multiplying complex numbers.

   (d) Derive the Taylor series for sine, cosine, and the exponential function, and use these to verify that $e^{i\theta} = \cos\theta + i\sin\theta$.

   (e) Give the definition of an isometry.

   (f) Describe how to carry out the four types of isometries: translation, rotation, reflection, and glide reflection.

   (g) Describe how to identify an isometry and its defining elements (e.g., vector of translation, center and angle of rotation, line of reflection, line and vector of glide reflection) from a figure and its image under the action of the isometry.

   (h) Explain why an isometry is determined by its action on three non-collinear points.

   (i) Explain why an isometry can be carried out with at most three reflections.

   (j) Be able to develop the formulas for translations and rotations, and also express them in the form of $3\times$ matrices.

(k) Be able to recover the cosine, sine, and center of rotation from a given rotation formula.

(l) Explain how to compose certain isometries, such as two translations, two reflections, two rotations.

(m) Be able to create a "multiplication" or composition table, such as the one we did for the eight isometries associated with the symmetries of a square.

(n) Be able to apply a translation, rotation, or scalings to curves described by formulas, and write the formulas for the transformed curves.

(o) Be able to describe the effects of the parameters a, b, c, d for a function of the form $y = a * f(b * (x - c)) + d$.