

**MA 341 Exam #1 Review**  
**Exam #1 will be in class on Wednesday, September 19**

1. Read and review the “Log of Class Activities” from the course website through Monday, September 17.
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.
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) Solve Problems 1.1.3, 1.1.5, 1.1.6, 1.1.7.
  - (b) Explain the meaning of the various features of axiomatic systems—consistent, independent, complete, categoric, model.
  - (c) Given an axiomatic system (such as axioms for people and committees), be able to determine and justify if the system is consistent or not, if each axiom is independent or not, and if the system is categoric or not.
  - (d) Solve Problems 1.2.1–1.2.5.
  - (e) Solve Problems 1.3.1–1.3.2.
  - (f) Explain the significance of Euclid’s *Elements*.
  - (g) State Euclid’s Fifth Postulate (the Parallel Postulate) in your own words, including a diagram.
  - (h) Prove Theorem 2.1.2 from Axiom 2.1.1.
  - (i) Give the definitions of point and line in the analytic model of plane Euclidean geometry  $\mathbf{E}^2$ .
  - (j) Solve Problems 2.1.4–2.1.6.
  - (k) Find the point-slope form and the slope-intercept form of a line.
  - (l) Derive the formula in Theorem 2.1.8.
  - (m) Solve Problems 2.1.9–2.1.10.
  - (n) Solve Problem 2.1.13.

- (o) Solve Problem 2.2.2.
- (p) Solve Problems 2.3.1–2.3.2.
- (q) Solve Problems 2.4.2–2.4.4.
- (r) Explain how to use matrix representation and multiplication by an inverse matrix to derive the formula in Theorem 2.5.1.
- (s) Use Theorem 2.5.1 to find the intersection of two lines.
- (t) Describe how Euclid constructs an equilateral triangle in Book I, Proposition 1. Describe how Euclid constructs an angle bisector in Book I, Proposition 9. Describe how Euclid constructs a line segment bisector in Book I, Proposition 10.