MA 111 Review for Final

The final exam (Thursday, May 6, 8–10 am, held in our regular classroom) will cover all of the material in the course. The formulas provided with the third exam will also be provided for the final exam.

Study the review sheets for the past three exams and review the Class Notes on the website. Can you work each homework, quiz, and worksheet problem *correctly* and *quickly*, providing explanations and justifications, without looking at the text or your notes? Have you carefully studied the material in the text?

1. For each of the following misleading elements of graphs, be able to explain what is meant, and be able to identify a graph with that characteristic. (See examples in the Gallery of Data Visualization.)

   (a) Icons or symbols representing quantities are not proportional in length or area to the quantity being represented. (Example: Fuel Economy Standards for Autos.)

   (b) The items on an axis are not spaced regularly. (Example: Incomes of Doctors Vs. Other Professionals.)

   (c) The options on a pie chart do not represent all of the possibilities, represent overlapping cases, or are not computed properly. (Example: 2012 Presidential Run.)

   (d) Insufficient context is provided. (Example: Connecticut Traffic Deaths.)

   (e) Monetary values are not adjusted for inflation. (Example: Over a Quarter-Century The Currency Pile-Up Steepens.)

   (f) Two or more graphs with different scales are superimposed. (Example: Rising Signs.)

   (g) A misleading scale is used (e.g., low ranking numbers may actually be better). (Example: Rising Signs.)

   (h) Visual presentations may suggest trends that do not actually exist. (Example: Sotheby's/Christie's Worldwide Sales Market Share Analysis.)

   (i) Presentation of data may obscure trends and rankings. (Example: Total Expenditures on Health.)

   (j) Correlation may incorrectly be used to imply causation. (Example: Infant Mortality Rate vs. CO_2 Emissions that I made from the Gapminder website.)

2. Identify the following types of graphs and be able to interpret and use data presented in such graphs. (See the Wikipedia article "Chart".)

   (a) Histogram: "typically shows the quantity of points that fall within various numeric ranges"

   (b) Bar chart: "uses bars to show frequencies or values for different categories"

   (c) Pie chart: "shows percentage values as a slice of a pie"

   (d) Line chart: "is a two-dimensional scatterplot of ordered observations where the observations are connected following their order"