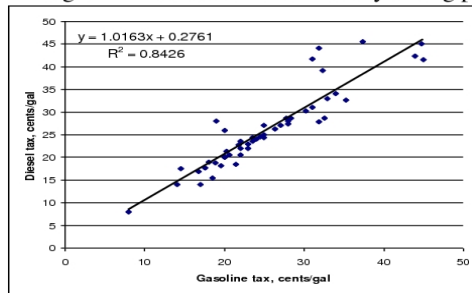


### Math 110 Winter 2010, Midterm 3 practice

#### Instructions

- Closed book, closed notes, except for one 8.5"-by-11" (or A4) sheet of paper, okay to use both sides. You may be required to turn in your note sheet with the exam, so write your name on it.
- 75 minutes are allowed for this exam.
- Clearly indicate your answer.
- You must show all relevant work and justify your answers appropriately.
- Partial credit will be given, but not without sufficient support.
- No calculators that have a QWERTY-type keyboard are allowed. The proctor's discretion is final.
- **THIS PRACTICE TEST DOES NOT INCLUDE EVERY TOPIC THAT MIGHT BE ON THE REAL TEST!**
  - A good way to study is to make a list of all the types of problems we've talked about (in class, worksheets, the textbook, homeworks, and projects) and make sure you know how to do each type, and understand the connections between them.

#1 This graph shows the gas tax and diesel tax for most of the 50 US states, in cents/gallon. Note that there is a very strong positive correlation.



If you're living in a state with a gas tax around 20 cents/gal gas tax and you move to a state with a gas tax around 25 cents/gal, are you guaranteed that the diesel tax will be higher in your new state than your old state? Write a sentence in response.

#2 Perhaps you have heard about Asian Carp and their potential to invade the Great Lakes. Recently someone did a study to see how close to Lake Michigan they have come. In a certain section of a river, they went fishing with nets to see what they caught. Suppose they caught 253 fish, of which 4 were Asian Carp.

- a) What is the population that this study is trying to consider?
- b) What is the sample?
- c) A member of Congress wants to know: what percent of the fish in the river are Asian Carp? Write a carefully phrased sentence using the given information.
- d) Name at least one possible source of bias in this study.

#3 Two of Prof. Ross's Math 319 students did a study comparing the EMU Parking Structure to the Green Lot. They found that at 10am on a Tuesday or Thursday, the chance of getting a spot in the Structure was about 5%; the chance of getting a spot in Green Lot was 100% (it has never filled up!). Suppose it takes 3 minutes to circle through the structure looking for a spot, then 5 minutes to walk to class in Pray-Harrod, versus 1 minute to find a spot in Green lot then 8 minutes to walk to Pray-Harrod. And it takes 2 minutes to drive to Green lot from the Structure.