**Midterm Review- Fall 2015**

**Exercises from previous years’ midterms (except from 2008, 2011, 2012, and 2013)**

2007 #5. (5 points) Give the definition and interpretation of homoskedasticity (you might find it helpful to draw a picture or give a concrete example).

2007 #6. (5 points) Suppose a military dictator in an unnamed country holds a vote and claims that he was supported by 65% of the voters. An NGO hires you to investigate the validity of the dictator’s claim. You draw a random sample of 200 voters and find that 115 people actually voted yes. Based on your own sample, construct a 95% confidence interval for the true support for the dictator in the population. What do you conclude on the probable honesty of the dictator’s claim?

2008#2. (5 points) In 2004, Florida voted 47.1% for the democratic candidate to the presidency. A poll of 765 likely voters conducted this week shows that 51% of them favor the democratic candidate. Is there evidence that the current support for the democratic candidate among Florida voters is higher than 4 years ago, at the 5% significance level?

2008#3. (15 points) From a random sample of young employees, we have estimated the following equation for hourly wage:

= 0.29 + .092 education + .0041 experience - .006 nonwhite R2 = .32

(.11) (.007) (.0017) (.064) n = 526

a. Interpret the results on the effect of education on wage.

b. How would the estimated effect of education be affected by not including the nonwhite variable in the equation? Justify your answer.

c. How would the estimated effect of education be affected by not including the experience variable in the equation? Justify your answer.

2009#1. (5 points) *X* and *Y* are two random variables with means  and , variances  and , and covariance . Compute the mean and variance of the following random variable:



2009#2 (5 points) To investigate possible gender discrimination in a firm, a sample of 100 men and 64 women with similar job descriptions are selected at random and independently. A summary of the resulting monthly salaries is:

Average Standard Number of

salary deviation observations

Men $3100 $200 100

Women $2900 $320 64

Do these data provide statistically significant evidence that the wages of men and women are different?

2010 #1. (5 points) Suppose a mutual fund has an annual rate of return that is approximately normally distributed with mean 10% and standard deviation 4%.

Find the probability that your annual rate of return will be negative.

Final 2012#4. (5 points) Suppose you have a random sample of people in the U.S. with data on the average number of hours they sleep each week, and their age in years. You obtain the following regression results with this data:



Instead, a colleague of yours tries a quadratic functional form and obtains the following results:



Your colleague argues that the information above is enough to conclude that her regression, model (2), is a better fit. Is this correct? Explain why or why not.

Final 2008#3d. Now suppose you estimated the following two equations



Explain how you would decide which does a better job of predicting wages.