Sept 19 Homework

WORK ANY 5 PROBLEMS (No extra credit for doing more than 5, clearly indicate which problems to be graded)

1. Schumer problem 2.2. (Hint: using Schumer's comments in the back of the book, it is easy to show this polynomial is divisible by 2 and 3; use induction to show it is divisible by 5)

2. Show that any postage of 8 cents or more can be made exactly using 3 and 5-cent stamps.

3. Suppose we want to weight two coins such that when both are tossed, the probability of 2 heads = probability of 2 tails = α. For what range of values of α is this possible?

4. Schumer problem 2.8. (Note typo in example, should be 13,37,61.)

5. Schumer problem 2.9c.

6. Prove there is at least one nonzero digit between the thousandth and three-thousandth decimal digit representation of $\sqrt{2}$. You should use the fact that $\sqrt{2}$ is irrational.

7. Prove that $e = \sum_{n=0}^{\infty} \frac{1}{n!}$ is irrational. (Hint: set the sum to p/q and multiply both sides by q!).