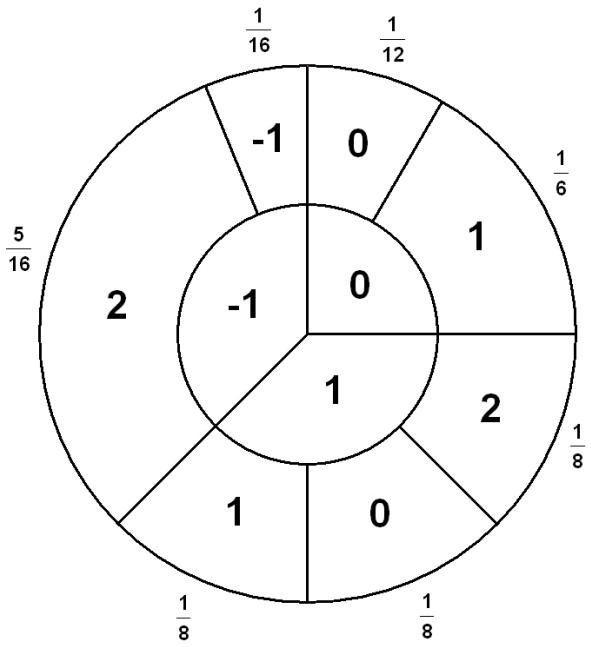
Kenneth Swain **Homework 9** **Due 11-08-2013**

1. Suppose an urn contains 9 balls: 2 red balls, 3 yellow balls and 4 purple balls.
   (a) Suppose that a ball is drawn from the urn at random. Find the probability of getting a red, yellow and purple ball respectively.
   (b) Make a wheel that corresponds to the experiment
   (c) Suppose for a homework assignment I instructed the students to draw from the urn 1000 times (and put the ball back in after each draw) and report how many of each balls they get. One student reports back that he got 239 red balls, 337 yellow balls and 424 purple balls. I suspect he did not do his homework and made up his answers. I do a χ^2-test to test my theory.
      (a) State the null and alternative hypothesis.
      (b) Compute the χ^2 statistic.
      (c) I only want to accuse him of falsifying data if his data is only possible in 1 in 100 times this experiment is done. Do I have enough evidence?

2. Suppose you are given data that is reported to come from the outer values of the following wheel:



The data is:

value	number observed
-1	52
0	311
1	151
2	386

Do a χ^2 test to determine if there is enough evidence to say that the data does not come from this wheel.

3. (a) What is the name of your partner (or partners) for your project.

   (b) What topic(s) are you thinking about doing. If more than one group picks the same topic we will have to have a discussion on how to make sure the topics are different enough.