Assignment 15: Probability (5.7)   **Name**_____
Please provide a handwritten response.

In this assignment you will use your calculator to simulate the repeated tossing of eight coins and keep track of the number of heads appearing in each toss. You will then use the program **cointoss( )** to create a histogram describing the experiment.

1a. A single toss of one coin can be simulated on your calculator by **rand(2)** which will generate either a **1** or a **2** at random, each with probability $\frac{1}{2}$. A head will be considered a **2** and a tail will be considered a **1**. You can repeat this command by pressing enter without having to retype it. Execute this command ten times and list the results below.

1b. You can simulate tossing eight coins once on your calculator by running the program **coins( )** on your calculator. This program will generate a list of eight **1's** or **2's** with the **2's** representing heads and the **1's** representing tails. Perform this command three times by entering **8** for the number of coins and **3** for the number of trials and record the results below. Also record how many heads appeared in each toss.

1c. In order to generate a large number of trials and keep the data recorded use a program called **cointoss( )**. Run **cointoss( )** with *n*=25 and *m*=8 and record the number of heads for each trial below. The program will pause for you to record this information.

1d. In the table below enter the number of occurrences in part **c** of each possible outcome, as a fraction of the total of twenty-five tosses. A sample is provided but your specific numbers will probably be different.

| # OF HEADS	0	1	2	3	4	5	6	7	8
OCCURRENCES	$\frac{\ }{25}$	$\frac{\ }{25}$	$\frac{\ }{25}$	$\frac{\ }{25}$	$\frac{\ }{25}$	$\frac{\ }{25}$	$\frac{\ }{25}$	$\frac{\ }{25}$	$\frac{\ }{25}$
(SAMPLE)	$\frac{0}{25}$	$\frac{0}{25}$	$\frac{1}{25}$	$\frac{5}{25}$	$\frac{10}{25}$	$\frac{4}{25}$	$\frac{3}{25}$	$\frac{1}{25}$	$\frac{1}{25}$

1e. You can easily draw the histogram by pressing enter from the pause in the program on the calculator. Press **ENTER** to display the resulting histogram and sketch it on the axes provided below. After the histogram is drawn press **ENTER** again and exit the program. You can now **TRACE** on the histogram to find the number of occurrences of each number of heads.
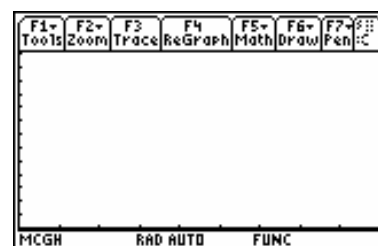
$0 \le x \le 9, 0 \le y \le 13$

1f. Repeat this experiment using 50 tosses of the coins. (Be patient, it will take a while!) How many occurrences of each number of heads were there? Record your data in the chart below and sketch the histogram on the axes provided. Are the y values sufficient for the histogram here? Will these values always be?

# OF HEADS	0	1	2	3	4	5	6	7	8
OCCURRENCES	$\frac{\ }{50}$	$\frac{\ }{50}$	$\frac{\ }{50}$	$\frac{\ }{50}$	$\frac{\ }{50}$	$\frac{\ }{50}$	$\frac{\ }{50}$	$\frac{\ }{50}$	$\frac{\ }{50}$
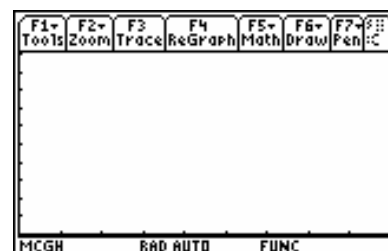
$0 \le x \le 9, 0 \le y \le 250$

BE SURE TO TURN <u>PlotsOff</u> (from Catalog) BEFORE DOING ANY FURTHER GRAPHING!!!