MthSc 301 Sec 3: Test No.1

Name _________________________________

**SHOW ALL YOUR WORK**

**No 1.** (10 pts)
(a) What is the major difference between an *observational study* and a *scientific study*?
(b) What is *cluster sampling*, and describe when it may be appropriate to be used?
No 2. (20 pts) Two four sides dice (each die is in the shape of a tetrahedron) are simultaneously rolled and the color of the down faces recorded. One die has two faces colored red, one green and the other blue. The other die has one face colored red, one colored green and two colored blue.

Let $A$ denote the event that at least one die is red, and $B$ denote the event that the dice have the same color.

(a) List the 16 possible outcomes from the experiment. (Hint: Label to the two red faces $R_1$, $R_2$ and the blue faces $B_1$, $B_2$.)

(b) Are $A$ and $B$ mutually exclusive events? (Explain your answer!)

(c) Describe in words the event $A \cup B$, and compute $P(A \cup B)$.

(d) Compute

(i) $P(A)$
(ii) $P(B)$
(iii) $P(A \cap B)$. 

No 3. (20 pts) Student Services recently surveyed students to determine how much students paid annually for cellular phone services. The following data (in dollars) was collected:

361 393 430 543 566 610 763 851
886 887 976 1039 1124 1267 1328 1415
1425 1444 1476 1542 1544

(a) Construct a histogram of the above data. (Use 5 classes).
(b) Determine the mean and the median of the data, and describe what these two numbers represent.
(c) Compute the standard deviation and interquartile range of the data.
(d) Draw a box-and-whisker plot for the data.