

MATH 323. TEST I

NAME:

Directions: You may use your own calculator and your own textbook. You may also use a summary (one side of an 8.5"x11" sheet of paper with notes in your writing). You may use nothing else. You may not pass a calculator, textbook or summary to another person. To receive full credit you must show all your work. Erase or cross out any work you do not want graded.

1.(15 points) For a random variable X , the probability function is given by $p(x) = 1/2, 1/3, 1/6$, for $x = -2, 1, 2$ respectively. Find the variance of X .

2.(15 points) Suppose A and B are independent events such that $P(A \cup B) = 0.7$ and $P(A) = 0.3$. Find $P(B)$.

3.(15 points) You throw a pair of fair dice 3 times. What is the probability that you get a sum of 7 exactly two times?

4.(20 points) Suppose that, on average, a post office handles 10,000 letters a day with a standard deviation of 60. How high is the probability that this post office will handle between 9700 and 10,300 letters tomorrow?

5.(20 points) A box contains 10 balls, of which 4 are green and 6 are yellow. You pay \$1 to play the following game: Take out 3 balls at random, without replacement. You win \$2 if you get 2 green balls and a yellow one. Otherwise you win nothing.

(i) What is the probability of winning in this game?

(ii) Do you expect to win or to lose money by playing this game? Justify your answer.

6.(15 points) A business bought 70% of its computers from IBM and 30% from DELL. The proportion of computers with a Pentium III processor is 50% for the IBM computers and 70% for the DELL computers. A computer selected at random is found to have a Pentium III processor. What is the probability that this computer is made by IBM?