| MA 110-06<br>§3.3 – 4.4 | **Test #2** | *score* | **Name:** _____<br>**21 November 2002** |
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1. If two dice are rolled, find the probability that the sum of the dice is 8. *(9 points)*

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2. Find the probability of being dealt four cards in the same kind in a five-card hand. Express your answer as a decimal number. *(9 points)*

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3. We play a lottery in which three numbers in the range 1 through 16 are selected. Find the probability of winning this lottery, i.e., the probability of picking the three correct numbers. Then find the probability of picking exactly two of the three correct numbers. *(9 points)*

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4. If four dice are rolled, find the probability that they all show different numbers. Then find the probability that there is at least one repetition among the four. *(9 points)*

5. You and one of your math friends decide to play a game. Each of you rolls a die. If both dice are even, your friend pays you \$10. Otherwise, you pay your friend \$3. What is the expected value of this game from your point of view? Would this be a profitable game for you to play repeatedly? *(9 points)*

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6. A fight is about to break out in the student cafeteria over whether math classes are more fun that statistics classes, or vice versa. A sociology major takes a quick survey and finds that among the men, 28 favor math, 21 favor statistics, and 8 have no preference, whereas among the women, 18 favor math, 23 favor statistics, and 4 have no preference. *(9 points)*

   (a) Find the probability that a student prefers math.

   (b) Find the probabiilty that a student prefers math, given that the student is a woman.

   (c) Find the probability that a student is a women given that the student prefers math.

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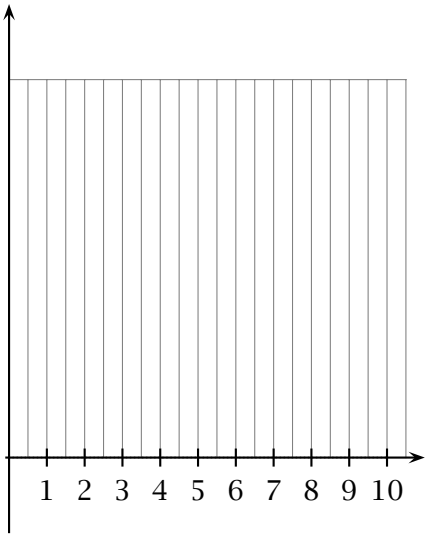
7. In a roll of two dice, let $A$ be the event that the sum of the two dice is 6, and let $B$ be the event that one of the dice is a 3. Are events $A$ and $B$ independent? Are they mutually exclusive? Explain. *(9 points)*

8. Draw a *relative frequency histogram* for the dataset {5.1, 1.5, 2.3, 5.0, 9.1, 1.2, 7.4, 8.9, 7.1, 4.4, 3.2, 7.2, 8.7, 2.9, 3.1, 7.9, 2.1, 8.1, 7.9}. Use 5 data groups each of width 2 starting at 0 (so that $0 \le x < 2$ describes the first category). *(10 points)*




9. Calculate the mean and median of the data set $S = \{3, 1, 5, 3, 7, 4, 9, 11, 2, 8\}$ *(9 points)*

10. Find the variance and standard deviation for the data set $S = \{6, 4, 7, 9\}$. *(9 points)*

11. If a population is normally distributed with mean 14.2 and standard deviation 2.8, find the probability that a randomly chosen member of the population is less than 12.0. *(9 points)*