

MA 110-91 §3.1 - 4.2	Test #2	<i>score</i>	Name: _____ 13 April 2002
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1. Two dice are rolled. Write out the complete sample space and use it to find the probability that two dice differ by more than 2. Explain. *(10 points)*

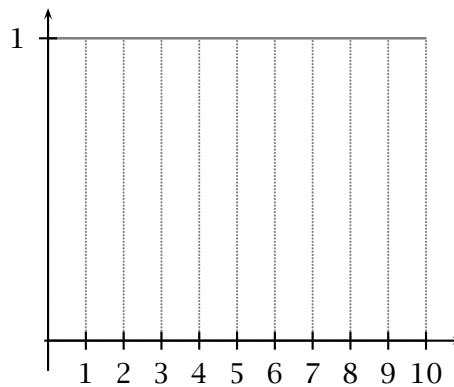
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2. Four fair coins are tossed. Find the probability that there are more heads than tails in the result. Explain. *(10 points)*

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3. Find the probability of being dealt four cards from the same kind in a five-card hand. Explain your counting methods. Express your answer as a decimal number. *(10 points)*

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4. If three dice are rolled, find the probability that there is at least one six among the three results. Explain. (10 points)
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5. We play a lottery in which four numbers in the range 1 through 15 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 three of the four correct numbers. Explain. (10 points)
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6. You and two of your best math friends decide to play a game. Each of you flips a coin simultaneously. If all three coins match, each of your friends pays you \$5. If they don't all match, you pay each of your friends \$2. What is the expected value of this game from your point of view? Would this be a profitable game for you to play repeatedly? (10 points)
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7. Two cards are selected. Let E_1 denote the event that the first card is a heart, and let E_2 denote the event that the second card is a heart. Are E_1 and E_2 mutually exclusive? Are they independent? Explain. (10 points)

8. An electronics manufacturer buys its chips from three factories: A, B, and C. Factory A supplies half of the total chips while B and C each supply one-quarter. If the defective rates of the chips from the three factories are 1%, 2%, and 3%, respectively, find the probability that a randomly selected chip is defective. (10 points)

9. Draw a *relative frequency density histogram* for the dataset {3.8, 4.5, 5.3, 5.6, 6.2, 6.6, 7.2, 7.4, 8.9, 7.1, 9.2, 8.2, 7.7, 7.9, 8.1, 7.9, 8.1, 9.4, 9.9}. Use 5 data groups (bins): $0 \leq x < 5$, $5 \leq x < 7$, $7 \leq x < 8$, $8 \leq x < 9$, and $9 \leq x \leq 10$. (10 points)



10. Calculate the mean and median of the data set $S = \{8, 3, 12, 17, 11, 14, 9, 7, 5, 13\}$ (10 points)