Math 200

Name:_____
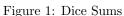

Figure 1: Dice Sums

(1) Consider the table of dice sums above (figure 1) and use it to help you with the questions below. For all cases except (i), assume the two dice are rolled once.

    (a) How many sums are less than 7?   What is the probability of rolling a sum less than 7?

    (b) How many sums include a black 2? _____   How many sums include a white 5? _____

    (c) How many sums include a black 2 or a white 5?   What is P(black 2 or white 5)?_____

    (d) Find P(black 2):_____   Find P(white 5): _____

    (e) Find P(rolling a black 2 and a white 5): _____

    (f) Find P(7): _____
    (g) Find P(7 or 11): _____
    (h) Find P(7 and 11): _____

    (i) Find P(rolling two 7's in a row): _____

    (j) Find P(2 or 3 or 12): _____

(2) Now consider some special cases

    (a) If you roll one die what is the probability that you don't roll a six? _____

    (b) If you roll one die two times what is the probability that you roll no sixes? _____

    (c) If you roll one die three times what is the probability that you roll no sixes? _____

    (d) Find the difference 1 − P(No sixes in four rolls) and explain what it means. _____

(3) A bag contains 12 marbles: 3 blue, 4 red, and 5 green. Find the probabilities below.

(a) P(red): _____

(b) With replacement, P(two reds in a row): _____

(c) Without replacement, P(two reds in a row): _____

(4) Suppose eleven cards are placed in a deck. five are Blue and labeled 1, 2, 3, 4, 5 while the other six are Yellow and labeled 1, 2, 3, 4, 5, and 6. Suppose you randomly draw one card.

◇ B = card drawn is blue
◇ O = card drawn is odd

(a) $P(B) =$ _____

(b) $P(B|O) =$ _____

(c) $P(O|B) =$ _____

(5) A striking trend in higher education is that more women than men reach each level of attainment. Here are the counts (in thousands) of earned degrees in the US in the academic year 2010 - 2011.

Degree

Gender	Bachelors	Masters	Professional	Doctorate	Total
Female	986	411	52	32	1,481
Male	693	260	45	27	1,025
Column Total	1,679	671	97	59	2,506

(a) Find P(Doctorate) and explain what it means.

(b) Find P(Masters|Female) and P(Female|Masters) and explain what the two mean.

(c) If you choose a degree recipient at random, what is the probability that the person is a woman, P(Female) = ?

(d) What is the conditional probability that you choose a woman, given that the person chosen received a doctorate?

(e) Are the events "choose a woman" and "choose a doctoral degree recipient" independent? How do you know?

(f) What is the probability that a randomly chosen degree recipient is a woman and the degree is a doctorate?

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