

Conditional Probability

1. Complete the following table using sums from rolling two dice. Use the table to answer questions 2-5.

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

2. 2 fair dice are rolled. What is the probability that the sum is even given that the first die that is rolled is a 2? $1/2$
3. 2 fair dice are rolled. What is the probability that the sum is even given that the first die rolled is a 5? $1/2$
4. 2 fair dice are rolled. What is the probability that the sum is odd given that the first die rolled is a 5? $1/2$
5. Steve and Scott are playing a game of cards with a standard deck of playing cards. Steve deals Scott a black king. What is the probability that Scott's second card will be a red card? $26/51$
6. Sandra and Karen are playing a game of cards with a standard deck of playing cards. Sandra deals Karen a red seven.



What is the probability that Karen's second card will be a black card?

$26/51$

7. Donna discusses with her parents the idea that she should get an allowance. She says that in her class, 55% of her classmates receive an allowance for doing chores, and 25% get an allowance for doing chores and are good to their parents. Her mom asks Donna what the probability is that a classmate will be good to his or her parents given that he or she receives an allowance for doing chores. What should Donna's answer be? $.25/.55 = 45.5\%$
8. At a local high school, the probability that a student speaks English and French is 15%. The probability that a student speaks French is 45%. What is the probability that a student speaks English, given that the student speaks French? $.15/.45 = 33.3\%$
9. On a game show, there are 16 questions: 8 easy, 5 medium-hard, and 3 hard. If contestants are given questions randomly, what is the probability that the first second contestant will get easy questions given that the first contestant received an easy question? $P(2^{\text{nd}} \text{ is easy} | 1^{\text{st}} \text{ is easy}) = 1/2$
10. On the game show above, what is the probability that the first contestant will get an easy question and the second contestant will get a hard question? $P(2^{\text{nd}} \text{ is hard} | 1^{\text{st}} \text{ is easy}) = 1/5$

11. Figure 2.2 shows the counts of earned degrees for several colleges on the East Coast. The level of degree and the gender of the degree recipient were tracked. Row & Column totals are included.

	Bachelor's	Master's	Professional	Doctorate	Total
Female	542	128	26	18	714
Male	438	165	38	20	661
Total	980	293	64	38	1375

- What is the probability that a randomly selected degree recipient is a female? $714/1375 = 51.9\%$
- What is the probability that a randomly chosen degree recipient is a man? $661/1375 = 48.1\%$
- What is the probability that a randomly selected degree recipient is a woman, given that they received a Master's Degree? $128/293 = 43.7\%$
- For a randomly selected degree recipient, what is $P(\text{Bachelor's Degree} | \text{Male})$? $438/661 = 66.3\%$

12. Animals on the endangered species list are given in the table below by type of animal and whether it is domestic or foreign to the United States. Complete the table and answer the following questions.

	Mammals	Birds	Reptiles	Amphibians	Total
United States	63	78	14	10	165
Foreign	251	175	64	8	498
Total	314	253	78	18	663

An endangered animal is selected at random. What is the probability that it is:

- a bird found in the United States? $78/663 = 11.8\%$
- foreign or a mammal? $498/663 + 314/663 - 251/663 = 84.6\%$
- a bird given that it is found in the United States? $78/165 = 47.3\%$
- a bird given that it is foreign? $175/498 = 35.1\%$

