

Conditional Probability; Events Involving “And”

Contemporary Math (MAT-130)

Solve each probability problem.

1. A jar contains 12 chocolate chip cookies and 9 Oreo cookies. If two cookies are chosen without replacement what is the probability that both cookies are chocolate chip?
2. If two cards are chosen with replacement what is the probability that both cards are red?

The composition of a high school student council is summarized below. Use the table for problems 3-6.

		Gender		Total
		Male	Female	
Grade	Sophomores	3	6	9
	Juniors	5	5	10
	Seniors	4	2	6
Total		12	13	25

3. What is the probability that a randomly chosen council member is female given that they are a senior?
4. What is the probability that a randomly chosen council member is a junior given that they are male?
5. What is the probability that two different randomly chosen council members are seniors?
6. If three different council members are selected at random what is the probability that the first two are female and the last is male?
7. In a shipment of 50 calculators there are 5 defective calculators. If three calculators are randomly chosen with replacement what is the probability that none of them are defective?
8. Over the weekend (Saturday and Sunday) there is a 30% chance each day that it will rain. What is the probability that it will not rain the entire weekend?
9. If a six sided die is rolled three times what is the probability that you get the same number each time?
10. A pair of six sided dice is rolled twice. What is the probability that the sum of the faces is eight both times?
11. If a single card is drawn from a standard deck what is $P(\text{spade}|\text{black})$.
12. If a number is chosen randomly from the integers 1 to 15 what is the probability that it is odd and divisible by three?
13. If a number is chosen randomly from the integers 1 to 15 what is the probability that it is a prime number given that it is odd?
14. If two letters are chosen at random what is the probability that they are your initials?
15. A bowl contains 20 jelly beans. 5 of them are green, 2 are yellow, 6 are red, 3 are orange, and 4 are blue. If three jelly beans are chosen at random without replacement what is the probability that the first is green, the second is red, and the third is yellow?

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Solutions:

1. $\frac{11}{35}$
2. $\frac{1}{4}$
3. $\frac{1}{3}$
4. $\frac{5}{12}$
5. $\frac{1}{20}$
6. $\frac{78}{575}$
7. $\frac{729}{1000}$
8. .49
9. $\frac{1}{36}$
10. $\frac{25}{1296}$
11. $\frac{1}{2}$
12. $\frac{1}{5}$
13. $\frac{5}{8}$
14. $\frac{1}{676}$
15. $\frac{1}{114}$