

Conditional Probability Homework

Directions: Be sure to show all work, communicate your thought process, and justify your reasoning. Remember to check that your answers are complete, correct, and reasonable.

1. Determine each probability. Show all calculations.

- a. In an animal shelter, there are 32 animals: twelve dogs, two bunnies, and eighteen cats. Five of the dogs, one bunny, and ten of the cats have mostly brown fur. The manager of the shelter will select one animal at random to be brought to visit a children's hospital. The manager does not know this, but Mark, a patient at the hospital loves brown dogs. What is the probability that the selected animal has mostly brown fur, given that the animal is a dog?
- b. David's batting average is .307, and Lucas' is .246. What is the probability that David will make it on base, given that Lucas makes it on base just before him?
- c. Consider the two-way table representing data for students in a given class who are taking electives, either art or music, but not both. What is the probability that a student selected at random is taking music as an elective, given that the student is a sophomore?

	Freshman	Sophomores	Juniors	Total
Taking an Art Elective	4	3	2	9
Taking a Music Elective	8	7	3	18
	12	10	5	27

2. Determine whether or not the events are independent. Support your answer.

- a. Consider the two-way table in problem 1, part c. Let event X be a student selected at random is a junior, and event Y be that a student selected at random is taking an art elective.
- b. Landing on an odd number when spinning a spinner numbered 1-10, and rolling a three on a six-sided normal die.
- c. Dara has a total of 10,338 songs on her iPod. Of these, 8,821 songs are more than five minutes long, 7,320 songs are labeled as house music, and 6,980 of the songs are more than five minutes long and labeled as house music. If Dara puts her iPod on shuffle, it will select a song at random. Let the events be A: the song selected at random is a house music song and B: the song selected at random is longer than five minutes.

**Throwback!**

1. Solve the equation: $4 - |2x + 1| = 3x - 2$

Remember to check for & identify any extraneous solutions.