Conditional Probability Homework

1. A random survey was taken to gather information about grade level and car ownership status of students at a school. This table shows the results of the survey.

Car Ownership by Grade

	Owns a Car	Does Not Own a Car	Total
Junior	6	10	16
Senior	12	8	20
Total	18	18	36

a) Find the probability that a randomly selected student will be a junior, given that the student owns a car.

$\frac{6}{18} = \frac{1}{3}$

b) Find the probability that a randomly selected student will own a car, given that the student is a senior.

$\frac{12}{20} = \frac{3}{5}$

2. The table below shows numbers of registered voters by age in the United States in 2004 based on the census. Find each probability in decimal form.

Age	Registered Voters (in thousands)	Not Registered to Vote (in thousands)	
18–24	14,334	13,474	27,808
25–44	49,371	32,763	82,134
45–64	51,659	19,355	71,014
65 and over	26,706	8,033	34,739
	142,070	73,625	215,695

a) Find the probability that a randomly selected person is registered to vote, given that the person is between the ages of 18 and 24.

$\frac{14,334}{27,808} = \frac{7,167}{13,904}$

b) Find the probability that a randomly selected person is ~~registered~~ not registered to vote, given that they are 65 and over.

$\frac{8,033}{34,739}$

c) Find the probability that a randomly selected person is between the ages of 45 and 64 and is not registered to vote.

$\frac{19,355}{215,695}$

3. A faculty advisor at Ridge High School surveyed 100 students about their preference for a social event. Of the 100 students surveyed, 50 were tenth graders and 50 were eleventh graders. Of the tenth graders, 30 chose a bowling party and 20 chose a dance. Of the eleventh graders, 20 chose a bowling party and 30 chose a dance.

a) Make a two way frequency table to represent the data.

		Bowling	Dance	
T=	10th	30	20	50
E=	11th	20	30	50
		50	50	100

b) Let T = 10th graders, E = 11th graders, B = Bowling, and D = Dance

Find P(B). $\frac{50}{100} = \frac{1}{2}$

Find P(B | T). $\frac{30}{50} = \frac{3}{5}$

Do you think that the probability of liking bowling is dependent on whether a student is in the 10th or 11th grade? Yes, 60% vs. 40%