Instructions: Show all work. If you use your calculator, state which functions and syntax was used as work.

1. If the probability of an event E is $P(E) = \frac{1}{7}$, what is the probability of the complement $P(\bar{E})$?

$$\frac{6}{7}$$

2. Given the table below, answer the following questions.

Observed values

educational level	smoking	status		
	never smoked	currently smoke	former smoker	totals
did not finish high school	25	40	30	95
high school graduate	30	30	40	100
BS degree	50	10	60	120
totals	105	80	130	315

a. What is the probability of not finishing high school and being a current smoker?

$$\frac{40}{315} \approx 12.7\%$$

b. What is the probability of not finishing high school or being a current smoker?

$$\frac{80}{315} + \frac{95}{315} - \frac{40}{315} = \frac{135}{315} \approx 42.86\%$$

c. What is the probability of being a current smoker given that one didn't finish high school?

$$\frac{40}{95} \approx 42.1\%$$

d. Is this probability the same as being a current smoker in the general population? Use this information to determine if smoking and completing high school are independent.

$$\frac{80}{315} \approx 25.4\%$$ not the same
                                      not independent

3. Suppose there is a bowl of coloured marbles containing 17 white marbles, 11 blue marbles, 5 yellow marbles and 9 green marbles. What is the number of ways one can select a blue marble, followed by a yellow or green marble and a white marble, in that order?

$$11 * 14 \times 17 = 2618$$

4. Suppose that you choose a random set of letters and numbers to be your AACC password. If the password is 8 characters long, begins with a capital letter, followed by one of ten special characters, and the remaining six characters can be any letter (capital or lower case) or any number, how many possible passwords of this sort are there?

$$26 + 26 + 10 = 62$$

$$26 \cdot 10 \cdot 62^6 =$$

$$80,318,101,760$$

$$\approx 8. \times 10^{10}$$

5. A school must select from among 15 faculty to play chaperone at the next school dance. If three faculty are selected randomly, how many ways are there for faculty to be chosen?

$$\binom{15}{3} = 15C3 = 455$$

6. How many ways can the letters of the word "beautiful" be rearranged?

$$\frac{9!}{2!} = 181,440$$