1)   From a survey of 500 students, it was found that 290 of them own an Auto (A), 350 own a Bike
         (B), and 50 of them own neither (no bike or auto).
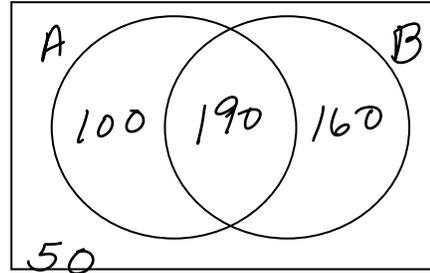
a. [5]   Draw and label a <u>complete</u> Venn Diagram that gives this information. <u>Be sure to define what your</u>
         <u>variables are beforehand!</u>

$n(A) = 290 \quad n(B) = 350$

$n(A \cup B)^c = 50 \qquad n(A \cup B) = 450$ ← 500−50

$450 = 290 + 350 - n(A \cap B)$

$n(A \cap B) =$

A ⬭ B
100 (190) 160
50

b. [5]   Find the following <u>probabilities</u>: (Express your answer as a decimal, not a fraction.)

$P(A) = \dfrac{290}{500} \qquad P(B) = \dfrac{350}{500} \qquad P(A \cup B) = \dfrac{450}{500} \qquad P(A \cap B) = \dfrac{190}{500}$

b. [5]   Using the defined variables, express in set and probability notation form the probability that a
         student either owns an Auto but not a Bike. You only need to give notation…no computations.

$P(A \cap B^c)$

c. [5]   Show how to compute the probability that a student either owns an Auto but not a Bike. Give a
         numeric result as your final answer. Be sure it's clear how you got it. Describe how your number
         relates to the graph you created above.

$P(A \cap B^c) = \dfrac{290 - 190}{500} = \dfrac{100}{500} = 0.2$

2) A bank looks at loan workouts that were successful (S) and that were borrowed by those with Graduate Degrees (G). They know the following:
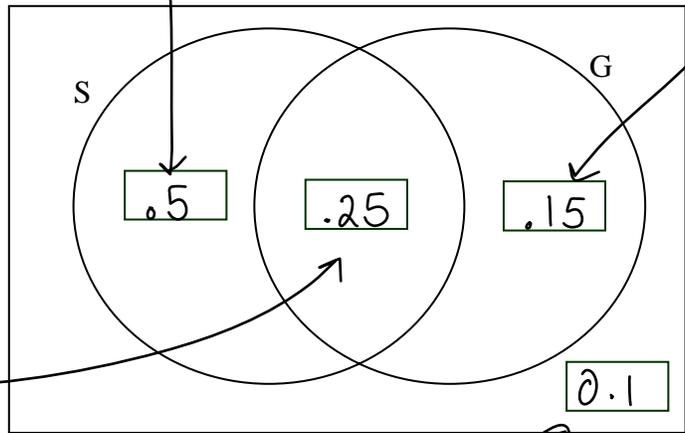
i. $P(S \cap G^C) = 0.50$

ii. The probability of a loan that is not successful but the lender has a Graduate Degree is 0.15

iii. $P(S \cup G)^C = 0.10$

a. [5] Use this information to fill in the probability diagram. Be sure to place numbers in each of the four boxes that correspond to the four regions of the diagram.

$1 - .5 - .15 - .1$

$= 0.25$

b. [5] Give the following:

i. The probability of a successful loan workout: 0.75

ii. The probability that client has a Graduate degree: 0.4

iii. The probability that the workout is successful or the client has a Graduate degree: 0.9

iv. The probability that the workout is successful and the client has a Graduate degree: 0.25

c. [5] Translate what $P(S \cup G)^C = 0.10$ means in words? For full credit, use the meanings of S and G as part of your answer. Use complete sentences.

The probability that a loan was neither successful nor taken out by a borrower with a Grad degree is 0.10

Please see the other side for the rest of the quiz!

3) In a shipment of 80 cars to an automobile seller, 75 cars had either a cassette player or a compact disc player. 35 total cars had a cassette player. 15 cars had both. (Let K be the set of cars with a cassette player and let D be the set of cars with a compact disk player.)

a. [5] How many cars had a compact disk player? Use the *General Counting Formula* to find your result and be sure to show your work neatly.

$$n(s) = 80 \quad n(K \cup D) = 75 \quad n(K) = 35 \quad n(K \cap D) = 15$$

$$n(K \cup D) = n(K) + n(D) - n(K \cap D)$$
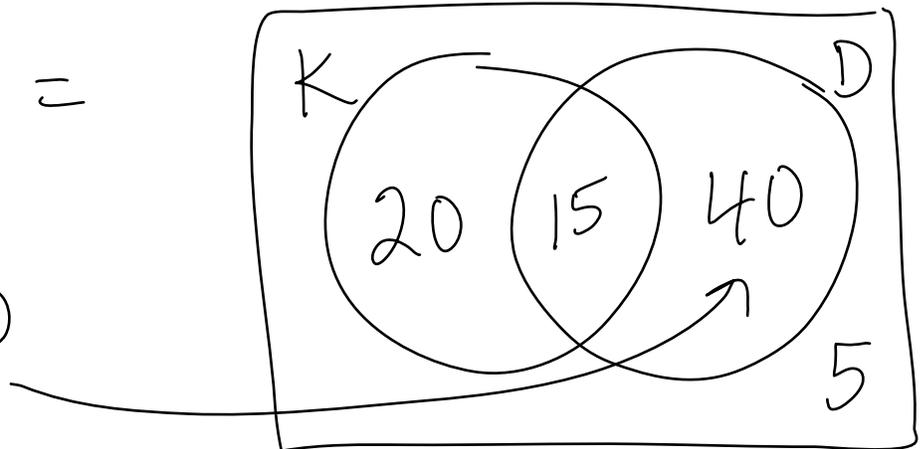
$$75 = 35 + x - 15$$

$$55 = x$$

55 cars had a compact disk player

b. [5] How many cars had only a cassette deck in them? Show work or a drawing!

$$n(D \cap K^c) =$$

$$55 - 15$$

$$= 40$$

c. [5] How many cars did not have a compact disk player? Show work or a drawing!

$$n(D^c) = 80 - 55 = 25$$

Please see the other side for the rest of the quiz!