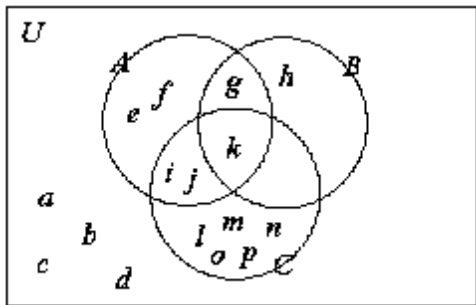


Quiz 3

Every answer must be fully justified. Show your work!!!

1. Use the Venn diagram below to find the indicated sets.



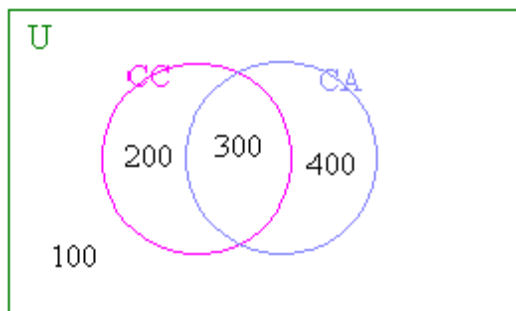
(a)  $A \cap B = \{e, f, g, i, j, k\} \cap \{g, h, k\} = \{g, k\}$

(b)  $B \cap C' = \{g, h, k\} \cap \{a, b, c, d, e, f, g, h, i, j, k\} = \{g, h\}$

(c)  $(A \cup B \cup C)' = \{e, f, g, h, i, j, k, l, m, n, o, p\}' = \{a, b, c, d\}$

2. Suppose you take a survey of 1000 college students. 300 of them have both a credit card and a checking account. 700 of them have a checking account and 500 of them have a credit card.

- (a) Construct a Venn diagram showing the results of this survey.



- (b) How many of the survey respondents have neither a credit card nor a checking account?

100 of them have neither a credit card nor a checking account.

3. Translate the following argument into symbolic form:   
 If that animal is a bird then it can fly.   
 If that animal cannot fly, then it must be hurt.   
 -----   
 ∴ That animal is not hurt.

$p$  : That animal is a bird.      $q$  : That animal can fly.      $r$  : That animal is hurt.

$$\frac{p \rightarrow q}{\sim q \rightarrow r} \therefore \sim r$$

4. (a) Use a truth table to show that this argument is invalid:   

$$\frac{p \rightarrow q}{q \rightarrow p} \therefore p \wedge q$$

$p$	$q$	$p \rightarrow q$	$q \rightarrow p$	$(p \rightarrow q) \wedge (q \rightarrow p)$	$p \wedge q$	$((p \rightarrow q) \wedge (q \rightarrow p)) \rightarrow (p \wedge q)$
T	T	T	T	T	T	T
T	F	F	T	F	F	T
F	T	T	F	F	F	T
F	F	T	T	T	F	F

(b) Make up an argument in words that has the same symbolic form as this argument.

If I like ice cream then I have a car.

If I have a car then I like ice cream.

Therefore, I have a car and I like ice cream.