July. 17. Discussion

Final . July 27 1-4 p.m. in lecture room.
(No resources allowed)

200 points
7 questions
6 worth 25 each,
1 worth 50 .

Contrapositives

If statement A , then statement B .

Contrapositive:

If not statement B , then not statement A.

Converse: statement A

Example: If you drive the CA-60 westbound, then you will be in L.A.. statement B

Contrapositive:

If you will not be in L.A., then you do not drive the CA-60 westbound

Converse:

If statement B , then statement A .

converse:

If you will be in L.A., then you drive CA-60 westbound.

Inverse:

If not statement A, then not statement B.

If you do not drive the CA-60 westbound, then you will not be in L.A.

Let a.b.n be integers. If ab is not an integer multiple of n, then a is not a multiple of n and b is not a multiple of n.

Contrapositive:

the negation of "and" is "or" ∵ De Morgan's Law.

If a is a multiple of n or b is a multiple of n, then ab is a multiple of n.

Proof of contrapositive:

- Suppose a is a multiple of n. Then there exists an integer k that satisfies $a=kn$

So we have

$$ab=(kn)b$$
$$=(kb)n$$

Since kb is also an integer, we conclude that ab is a multiple of n.

- Suppose b is a multiple of n. Then there exists an integer l that satisfies $b=ln$

So we have

$$ab=(ln)a$$
$$=(al)n$$

Since al is also an integer, we conclude that ab is a multiple of n.