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CSC 400 SECTION 802(LOOP)
HOMEWORK #2

SECTION 2.3

11)

P	Q	R	~P	~Q	~R	P -->Q	Q v R	P-->Q v R	~Q v ~R	~P v ~R
T	T	T	F	F	F	T	T	T	F	F
T	T	F	F	F	T	T	T	T	T	T
T	F	T	F	T	F	F	T	T	T	F
T	F	F	F	T	T	F	F	T	T	T
F	T	T	T	F	F	T	T	T	F	T
F	T	F	T	F	T	T	T	T	T	T
F	F	T	T	T	F	T	T	T	T	T
F	F	F	T	T	T	T	F	F	T	T

The rows highlighted in green are the premises whereas the one in yellow is the conclusion row. The argument is INVALID due to there existing a scenario where both the premises are true and the conclusion being false(the row highlighted in light blue—critical row).

SECTION 3.2

8) There exists a simple solution to life's problems.

∀ solutions x, if x is a simple solution, then x is not a solution to life's problems

19) ∃ a integer n such that if n is a prime number then n is not odd and n ≠ 2

29) statement: ∀n ∈ Z, if n is prime then n is odd or n = 2.

Contrapositive: ∀n ∈ Z, if n is not odd and n ≠ 2, then n is not prime

Converse: ∀n ∈ Z, if n is odd or n=2 then n is prime

Inverse: ∀n ∈ Z, if n is not prime, then n is not odd and n ≠ 2

38) True; If Discrete Mathematics has a u, its lowercase. There is no lowercase u, so Discrete Mathematics has no u. Therefore, the statement is true.

47) If a computer program has an error message during translation, then it is not a reasonable program.

<u>SECTION 3.4</u>

13)Valid due to Universal Modus Ponens.
   If p then q,
   P
   Therefore q

19c)Valid; because that is Q therefore ~P, which is contrapositive.
19d)Invalid; because that is ~P therefore Q, which is the inverse.

<u>SECTION 4.1</u>

13)A counterexample would be $m=4$ and $n=3$; since $2(4)+3$ is 11(odd), but m and and n are not both odd, m is even and n is odd.

41)The error is in $mn=(2p)(2q+1)=2r$

50)Yes; since if $n-m$ is even then $n-m=2r$ and if $n-m$ is even and = $n-m=2r$ then
$n^3-m^3=$**$(n-m)(n^2+nm+m^2)$**<---**factor cube**
  =**$2r$**(n^2+nm+m^2)<--**substitute def of even for(n-m) to equal 2 some integer(in my case r)**

  Which equals the definition of an even number number=2r(pg.147 Epps book--I used r for variable whereas book uses n)

<u>SECTION 4.6</u>

20) step1) ∀x in D, if P(x) then Q(x)
    P(x)=sum of two real numbers is less than 50
    Q(x)=at least one of the numbers is less than 25

  Step2)∀x in D, if Q(x) is false then P(x) is false.
    Q(x)= one of the numbers is greater than 25

There exists no such case that a real number is greater than 25 where the sum of 2 numbers(with one being greater than 25) will yield a result that is greater than 50.