Problem D

multille a) Claim: Let RgZ2 be integer of 3. Let C,d be nonointegers such that (C-D) is not amultiple of 3. There is no such integer that n= cmode n= dmod q

Det pazz he integers of a Such that n= cmode Let (,d he non-regative into Such that (-d) is not a moltirle of3

Problem D

| Morbintegers Such that (C-D) is not amplified of 3. Let C, d be nor integer Such that (C-D) is not amplified of 3. There is no such integer that n= cmode n= d mode n= d mode n= d mode (la m q=31 1 ∈ 2 6 9 4 2 T(2) T(3) 2 F F F (8) F(7) T 3 6 5 3 T(4) T(6) 2 F F F (8) F(7) T 3 6 5 3 T(4) T(6) 2 F F F F (8) F (7) T

Det pass who have of a Such that n= cmode

Let (,d he non-regative into Such that (-d) is - not

a moltivle of 3

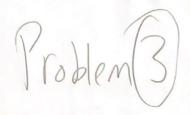
Problem O cont.

	proble .
NEC MOD PEdmoda	
N=PK+C N=gl+d	
n=PK+C n=gl+d mathematical statement	(Reason this statement is True (From approved List)
BWOC there is an a such that	Since this is the negatiation of
Suppose N= (modp & n=dmodq	the claim
=> n=px+c kez and	by def of mod applied to
n=gl+l, sled	each claim
=> PK+C=gl+d, K,lEZ	
=> 91=PK= C-d, Kl67/	by substitution by algebra
(=)(0) =/ (0)(0)	by def of miltide UF3
arb, l, K 674	
	by alaepea
be(2) => 3(m) = c-d	by algebra by product & diff of integers
MEZ	is an integer
=> Gd is anothele of	by def of multiple of 3
3	
=> Contra diction	because C-d is not amultide
	of 3

Problem 2 Continued

	mathematical statement	reason this statement is true
a Bwoc	and (AXB) =(BXC)	since this is the negation
Osuppose	1 15 A-C+0	of our claim
6=>	8+0	by def of X"
(3) >	atA, axc	by def of N_11
The second secon	Lasos & AXB	by det of "X"
8 ====	LOD E BXC	by def of "E"
6 >	a & B) 3 6 C	by def of X "
9 =>	LOS WE (AXB)	by def of X
8 =>	Layay & (BXC)	by def of E"
9 =>	a6 B, atc	by def of X"
10 -	QEC Contradicts	because in stap 3 we said
		ayc

Problem 2 Claim Let B be a non empty set, if (
if $(A \times B) \subseteq (B \times C)$ then $A-C=\emptyset$ $= (A \times B) \subseteq (B \times C) = A-C = \emptyset$ $= (A \times B) \subseteq (B \times C) = A-C = \emptyset$ = Qa) (AXB) E(BXC) A (A-C) + Ø < negation b) The claim breaks at step 8 because the statement says x'is not inc but (x, y) is inc which makes no sense



o) The negation of this statement's that there is at least one irrational number and one rational number and one rational

BWO C Suppose	mathematical statement X+Y=S, X, S & Q, Y&I	reason for this statement is true Negation uf claim
⇒	$\frac{\partial x}{\partial x} + 7 = \frac{\partial s}{\partial s}, \frac{\partial s}{\partial x} \frac{\partial s}{\partial x} \frac{\partial x}{\partial $	by def of rational
=> ^	7= rs - nx ns nx dsdx &	by simple algebra
0 7	Y= nsdx -nxds nsnxdsdx671 (ds)(dx ds)dx =0	by subtraction of Fractions
\Rightarrow	Y= \$\frac{1}{2} \q	by dot of product of ints is
17)	Y= 1 nd 6 7 d = 0	by def of difference of into is an int me said y is an irrational
->	contradict à because	me said y is an irrational