Name: Luong Thi Uy Thieu

Class: DMA-B05

***HOMEWORK***

***DISCRETE MATHEMATICS***

***PROBLEM SET 02***

***Problem 1***

x irrational -> 1/x irrational

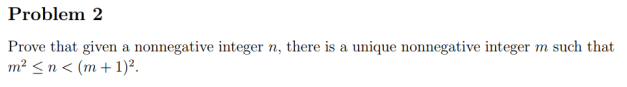
if 1/x is rational

=> 1/x = a/b (a,b Z)

=> x = b/a

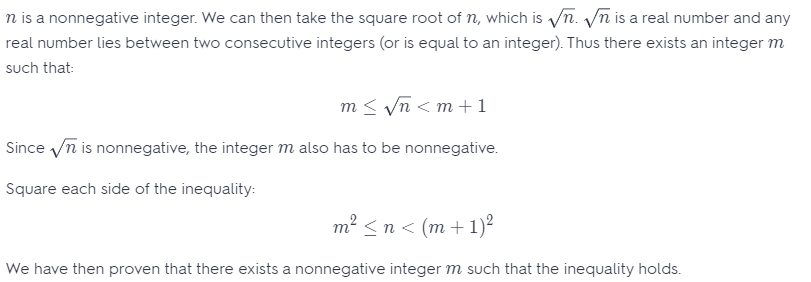
=> x is rational

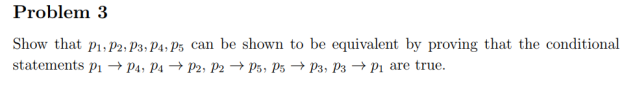
-Q=>-P = P=>Q



m2≤n<m+1^2

m≤ <m+1





Assume p1 is true:

p1->p4 => p4 true

p4 -> p2 =>p2 true

…..

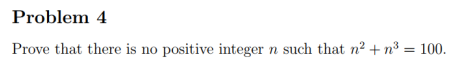
=> p5 true

Assume p1 is false:

p3->p1 => p3 is false

…..

p4 false



Assume there exits n

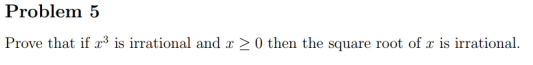
=> n^3 < 100 => = {1,2,3,4}

if n =1 f(n)=2

…..

n=4 f(n)=16+64=80

=> there is no positive integer n



if is rational => = ab

x= (a/b)^2= a^2/b^2

x^3= a^6/b^6 => x^3 rational



m=3^x (x,y are integers)

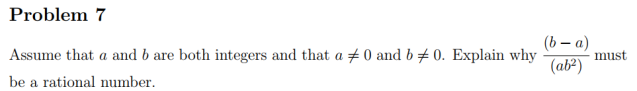
n=3^y

m+n = 3^x + 3^y

=> m+n=3x(1+3y-x)

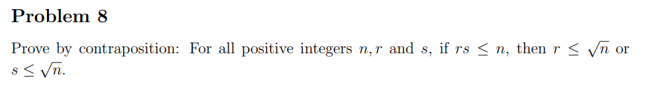
1+3^(y-x)) is indivisible by 3

=> m+n is not a power of 3

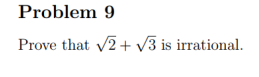


=

a,b C Z => 1/ab is rational and 1/b^2 is rational



if r2>n and s2>n => (rs)2>n^2 => rs > n



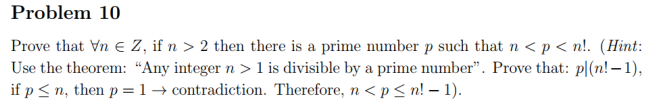
+= (a,b Z)

5+2= a^2/b^2

2= a^2/b^2-5

= (contradiction)

Therefore, +is irrational



P: n>2 Q: n<p<n!

if n>2 => n<p<n!

assume –Q: n!≤p≤n

=> n!≤n

=> n =1 or n =2

=> 0<n ≤2 (contraposition)

=> -P

-Q => -P

Therefore, P => Q