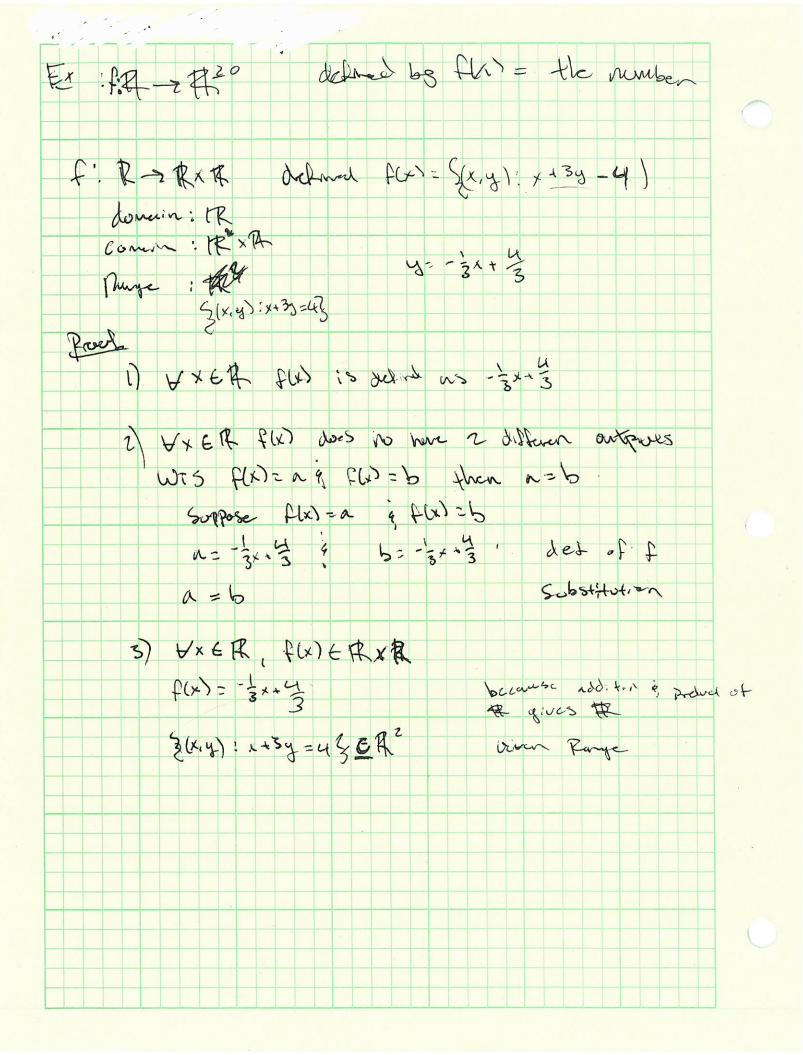
g: Z > Z defined by g(a)=1 Domain = 2 Codomain = 2 range = 1 1) Vac Z g(a) is defined as 1 2) To show Wae Z, g(a). does not produce 2 diff. outputs. WTS that if g(a) = a and g(a) = b then a = b. Statement reason by def of g 9=1 by det of g 6=1 Substitution. 9=0 3) Notice 1 E Z, there for for all a e Z g(a) E Z because this function sotisfies these 3 properties, it is a fundion, based on the definition of function. D

P: 220 -220 p(x)=x-1 THIS IS NOT A FUNCTION. IT VIOLATES RULE 3. PROOF. BY COUNTEREXAMPLY LET X=0, WHICH IS IN THE DOMAIN. p(0) = (0) - 1 = -1-1 IS NOT IN THE CODDMANN 20 VIOLATING PROPERTY 3.



f: Z->ZXZ defined by f(x)= {(x,y): x+3y=43 domain: Z codomain: ZXZ This is not a function, because violates (3) Let x=2, which is an int $f(2)=\{(2,\frac{3}{2}):(2)+3(\frac{3}{2})=4\}$ $f(x)=(2,\frac{3}{2})\notin \mathbb{Z}\times\mathbb{Z}$

2) E: Z > ZT, FZ defined by ECX) ZF is odd Domain: ZZ codomain: all Even numbers (2n) 1) all into one either odd on Even ECK) is defined for all 2 2) for each XEE, all into are either even or odd but not both 2 Lucynote: E(x) & Z 3) XXEZ, E(x) & Z ECK)= {T, F}, for all ints I note from Lucy: this is godd, but if we wanted to be very formal, here is now we could desit: 2) We want to show that $\forall x \in \mathbb{Z}$, E does not produce 2 diff. outputs. To do this, we show that if E(a) = Y and E(a)=2, then a=b. me prove using cases. case 1: let Y = T. Then a is even, so Z is also T. So Y = Z.

case 2: let Y=F. then a is odd, so Zis also F. So Y=Z.

since y is either T or F, the cases are exhaustive.