$\exists y \in \mathbb{N}, \ \forall x \in \mathbb{N}, \ x = xy$ 

Name:												
NetID:		Lecture:		В								
Discussion: Friday 11 12 1	2	3 4	1									
1. (5 points) Suppose that $ A  = p$ and $ B $ ; there from $A$ to $B$ ?  Solution: $\frac{q!}{(q-p)!}$	=q, p	$o \leq q$ . H	ow many	different one-to-one functions are								
2. (10 points) Check the (single) box that be	est chε	aracteriz	zes each it	tem.								
If a function from $\mathbb{R}$ to $\mathbb{R}$ is increasing, it must be one-to-one.	true		false									
$f: \mathbb{N} \to \mathbb{R}$ $f(x) = x^2 + 2$ onto $\square$	ot onto		not	a function								
$f: \mathbb{N} \to \mathbb{N}$ f(x) = 3 - x one-to-one	nc	ot one-to	o-one	not a function $\sqrt{}$								
We painted 12 mailboxes. There were choose from and each mailbox is painted vingle color. By the pigeonhole principle, appears on at least two mailboxes.	with a	l	true									

true

 ${\rm false}$ 

 $\forall x \in \mathbb{Z}, \ \exists y \in \mathbb{Z}, \ x \neq y \ \text{and} \ x + y = 0$ 

A

A

Na	me:									
NetID:				Lecture:			В	В		
Dis	cussion:	Friday	11 1	2 1	2	3	4			
1.	(5 points) to $B \times C$ ?	Suppose that	A  = p,	B =q,	C  =	n. H	low man	y different fu	unctions are th	iere from
	Solution: to $B \times C$ .	There are $q$	n elements	s in $B \times$	C. S	So the	ere are (	$(qn)^p$ ways to	build a funct	ion from
2.	(10 points)	Check the (s	single) box	that be	st cha	aracte	erizes eac	ch item.		
		n from $\mathbb R$ to lit must be on	,	y true	V	/	false			
	$g: \mathbb{N} \to \mathbb{Z}$ $g(x) =  x $		one-to-o	ne $\sqrt{}$		not	one-to-o	ne	not a functi	on
	$g: \mathbb{R} \to \mathbb{R}$ $g(x) = \sin(x)$	x)	onto	not	t onto	) \[ \]	1	not a functio	on	
	choose from single color	l 12 mailbox and each m . By the pi ppears on at	ailbox is p geonhole p	ainted vorinciple,	vith a , ther	,	<b>f</b> :	rue 🗸	false	

 ${\rm true}$ 

false