

Quiz 1

Math 344

Week One

1 Computations

1. Let $A = \{1, 2, 3, 4\}$ and $B = \{x, y, z\}$

- (a) Write down three functions from A to B that are injective, or write down “there are none”.
- (b) Write down three functions from B to A that are injective, or write down “there are none”.
- (c) Write down any function from B to B whose image is $\{x\}$.
(Write down any function f from B to B such that $f(B) = \{x\}$.)
(Write down any function f from B to B such that $\text{range}(f) = \{x\}$.)
(Write down any function f from B to B such that $\text{im}(f) = \{x\}$.)
(Write down any function f from B to B such that $f^{-1}(\{x\}) = B$.)

1. *Solutions.* Let $A = \{1, 2, 3, 4\}$ and $B = \{x, y, z\}$

- (a) There are none.
- (b) There are many, but here are three:

$x \mapsto 1$	$x \mapsto 1$	$x \mapsto 1$
$y \mapsto 2$	$y \mapsto 2$	$y \mapsto 3$
$z \mapsto 3$	$z \mapsto 4$	$z \mapsto 4$

- (c) There is only one such function and it is:

$x \mapsto x$
 $y \mapsto x$
 $z \mapsto x$

□