

**MATH 301/501 HOMEWORK-1 DUE AT THE BEGINNING OF CLASS ON
TUESDAY, SEPT. 15**

One goal for this course is for you to develop your skill in effectively communicating mathematics. With this in mind, you should clearly write up your solutions. Solutions with little or no justification will receive little or no credit.

- (1)
 - (a) Give a clear, concise definition of a function.
 - (b) Give a clear, concise definition of an injective function.
 - (c) Give a clear, concise definition of a surjective function.

- (2)
 - (a) Give an example of a function $f : \mathbb{Z} \rightarrow \mathbb{Z}$ that is injective, but not surjective.
 - (b) Give an example of a function $g : \mathbb{Z} \rightarrow \mathbb{Z}$ that is neither injective nor surjective.
 - (c) Give an example of a function $h : \mathbb{Z} \rightarrow \mathbb{Z}$ that is surjective, but not injective.
 - (d) Give an example of a bijective function $k : \mathbb{Z} \rightarrow \mathbb{Z}$.

- (3) *More to be posted.*