

# MAT312-AMS351

Applied Algebra  
HOMEWORKSET 4  
*Due October 25th*

1. From Section 2.1 do problems 1, 3 and 8.
2. Let  $X, Y$  be the sets  $X = \{a, b, c\}$ ,  $Y = \{A, B, C, D\}$ .
  - (a) Describe all the functions from the set  $X$  to the set  $Y$ . How many of them are there?
  - (b) Describe all the functions from the set  $Y$  to the set  $X$ . How many of them are there?
  - (c) If  $\mathbb{A} = \{1, 2, 3, \dots, n\}$  and  $\mathbb{B} = \{1, 2, 3, \dots, m\}$ , can you determine how many functions  $f : \mathbb{A} \rightarrow \mathbb{B}$  are? Prove that your answer is correct.
3. From section 2.2 do problems 5, 8 and 9.
4. From section 2.3 do problems 2, 3, 5 and 10.