

# Math 2001 Assignment 41

Your name here

Due Monday, December 8

**Reading 1.** Scheinerman, §17 (pp. 90–98)

**Problem 2.** (i) In class we saw that if  $f : A \rightarrow B$  is a surjection we could obtain a partition of  $A$  by taking  $P = \{f^{-1}\{b\} : b \in B\}$ . Explain how to undo this operation. In other words, show how to construct a set  $B$  and a surjection  $f : A \rightarrow B$  from a partition  $P$  of  $A$ .

(ii) In class we saw that if  $R$  is an equivalence relation on a set  $A$  then the set of equivalence classes of  $R$  on  $A$ , which is denoted  $A/R$ , is a partition of  $A$ . Explain how to undo this operation. In other words, explain how to take a partition  $P$  of  $A$  and produce an equivalence relation on  $A$ . (Hint: This is essentially the same as Scheinerman, §16, #5.)

**Problem 3.** Scheinerman, §16, #12

**Problem 4.** Scheinerman, §16, #13

**Problem 5.** Scheinerman, §16, #15

**Problem 6.** Scheinerman, §16, #16