

# Math 380, Section N1

## Homework 2

Due September 7, 2006, before class

**Problem 1.** Textbook page 82, Exercise 4 parts (a) and (c). Justify your answer using either limit rules (composition, sum, product, ratio, etc) or the definition.

**Problem 2.** Using the composition rule or otherwise show that the following functions are continuous

$$(a) \quad z = \frac{x}{x-y} \quad \text{in } x \neq y$$

$$(b) \quad z = \log(x^2 + y^2) \quad \text{in } (x, y) \neq (0, 0)$$

$$(c) \quad u = e^{x_1} \sin(x_2 x_3)$$

**Problem 3.** Textbook page 84, Exercise 7.

**Problem 4.** Find  $\frac{\partial u}{\partial x_2}$  for

$$(a) \quad u = \frac{x_2 x_3}{1 + x_1^2 + x_2^2}$$

$$(b) \quad u = \sqrt{e^{x_1 + 2x_2 + 3x_3} + x_2^2}$$

**Problem 5.** Textbook page 89, Exercise 2.

**Problem 6.** Textbook page 89, Exercise 4 parts (e) and (f).

**Problem 7.** Textbook page 90, Exercise 6.