

## (Math 170) Homework 2:

Due September 23, 2008

Exercise 1:

Part (a): Define using just recursion and multiplication the function which takes a natural number  $n$  and returns  $2^n$ .

Part (b): Define using just recursion and multiplication the function which takes two natural numbers  $n, m$  and returns  $m^n$ .

Exercise 2: Prove that for all  $n \geq 3$ ,  $2^n > 2 \cdot n$  (Hint use Exercise 1a and proof by induction).

Exercise 3: Heart of Mathematics Chapter 2.3 Exercise 5

Exercise 4: Heart of Mathematics Chapter 2.3 Exercise 7

Exercise 5: Heart of Mathematics Chapter 2.3 Exercise 9

Exercise 6: Heart of Mathematics Chapter 2.3 Exercise 15

Exercise 7: Heart of Mathematics Chapter 2.3 Exercise 20

Exercise 8: Heart of Mathematics Chapter 2.3 Exercise 22

Exercise 9: Heart of Mathematics Chapter 2.3 Exercise 32