Exam I

Name:

Instructions: Answer five questions for 10 points each or six questions for 9 points each. Clearly mark on this page how many questions you answered and circle which ones they are. If you do not mark this page, I will assume you want me to grade all the problems.

Number of questions answered: _____

1. Write a function `product :: [Int] -> Int` that computes the product of a list of integers.

2. What are the types of the following values?

(a.) `[True,False]`

(b.) `(True,False)`

(c.) `["a","b"]`

(d.) `['a','b']`

(e.) `[reverse, tail, init]`

3. What are the types of the following functions?

(a.) `third xs = head (tail (tail xs))`

(b.) `triple x = x*3`

(c.) `palindrom xs = reverse xs == xs`

(d.) `tuple x y z = (x,y,z)`

(e.) `rot (x,y,z) = (y,z,x)`

4. Show how the curried function `foo x y z = x + y * z` can be understood in terms of lambda expressions.

5. Using list comprehensions, give an expression that calculates the sum $1^3 + 2^3 + 3^3 + \cdots + 100^3$ of the first one hundred cubes.

6. The nth triangular number is defined to be the sum $1+2+3+\cdots+n$. Write a function `triangularNumber` of type `Int -> Int` that takes an integer `n` and computes the Nth triangular number using simple functions.