Exam

1. a) Rewrite the definitions below so that only the name of the function appears on the left hand side of the equation and without using a lambda expression.

   \[ f \ x = 5 + 8/x \]

   b) Do the same thing for the following definition

   \[ f \ x \ y = 3*y + x \]

2. Rewrite the following expression to use higher order functions from the standard prelude instead of list comprehensions.

   \[ [ f \ x \mid x <- [ y+4 \mid y <- ys, y<5]] \]

3. There is an error in the following definitions

   data Digits = Zero | One | Two | Three | Four | Six | Seven | Eight | Nine
   smallDigits = [Zero .. Three]

   Explain what the problem is and suggest a way to fix it.

4. Haskell is a pure functional language. Explain what that means and what the consequences of this property are.

5. What is the type and the value of the following expression:

   \[
   \text{do } "merry"; \text{ return } "christmas"
   \]

6. Give the types for the following operator expressions:

   a) \((.)\)(::)
   b) \((::.)\)
   c) \((.::)\)
   d) \((::::)\)