Fachbereich Mathematik und Informatik
Prof. Dr. K. Ostermann

Sebastian Erdweg, seba@informatik
Tillmann Rendel, rendel@informatik

Philipps Universität Marburg

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Programming Languages and Types
Group Exercise 5

G5.1 Monad laws

To qualify as a monad, one does not only need a type constructor and a bind/return implementation of the correct type. In addition, monads must respect the following three algebraic laws:

1. `(bind (return x) f)  == (f x)`

2. `(bind m return) == m`

3. `(bind (bind m f) g) == (bind m (lambda (x) (bind (f x) g)))`

Rephrase the laws in terms of do-notation.
Prove that the identity monad and the Maybe monad satisfy the laws.
Discuss why monads should obey these laws.