COL765
Quiz 2 solutions

Problem 1:

```
problem1 n
   | n < 0      = 0
   | n == 0     = 1
   | otherwise =    problem1 (n-1)
                  + problem1 (n-2)
                  + problem1 (n-3)

problem1_fast = (map foo [0 ..] !!)
   where foo 0 = 0
         foo 1 = 1
         foo 2 = 2
         foo 3 = 4
         foo n =    problem1_fast (n-1)
                  + problem1_fast (n-2)
                  + problem1_fast (n-3)
```

Problem 2:

```
import Prelude

deriv_dx f dx = \x -> ((f(x+dx) - f(x-dx)) / (2.0*dx))

deriv f = deriv_dx f dx
   where dx = 0.001

deriv_n 0 f = f
deriv_n n f = deriv_n (n-1) (deriv f)

main = print (deriv_n 2 sin pi)
```