Homework 2. Solution key.

Q1. a-c,e worth 1 point, code worth 2 pnts

a) Binary logarithm $\log_2(n)=x$, is a function of n, returning value s.t. 2^x = n

b) $\log_2(42) \approx 5.3923$

c) $\log_2(32) \approx 5$, there is only one number 2^5

d)

```
ComputeBinaryLog(N)
        l <- 0
        while N≥2
                N <- N / 2
                l <- l + 1
        end while
        Print 'Logarithm = ' l
```

e) will iterate floor($\lg_2(N)$) times, each iteration has 1 condition, 2 assignments

Q2. 2 points

Program:

DecStep	Instruction
0	PRINT 1
1	GO RIGHT
2	PRINT 0
3	GO RIGHT
4	PRINT 1
5	GO RIGHT
6	GO TO STEP 0 IF 0 IS SCANNED
7	GO TO STEP 1 IF 1 IS SCANNED

Binary Code:

001 011 000 011 001 011 101.1 110.10

A **B**

A - go to step 0, thus i = 0

B - go to step 1, thus i = 1

Q3. 2 points