Complexity and Algorithms, week 1

1. Exercise 1
   1. 2log 128 7
   2. 2log 2048 11
   3. 5log 125 3
   4. 3log 81 4
   5. 10log 1,000,000 6
   6. 7log 49 2
   7. log 16 4
   8. log 256 8
   9. log 1 2
   10. log (10242) 20
   11. log (16\*32) 9
   12. log (65536) 16
2. Exercise 2
   1. Log 10 3.5
   2. Log 20 4.3
   3. Log 30 4.9
   4. Log 100 6.7
   5. Log 200 7.5
   6. Log 300 8.3
   7. log 1000 9.9
   8. log 2000 10.9
   9. log 3000 11.5
3. 5 second delay, 2.5Mb/s N/2.5 + 5
4. 2 euro on first day, each day after it is doubled
   1. Fine at day N 2N
   2. After how many days will fine *N* be after at least *D* days 2log D
5. Big O notation
   1. 1 for loop n
   2. 2 nested for loops (n) (n) n2
   3. 2 nested for loops (n) (n2) n3
   4. 2 nested for loops (n) (n) n2
   5. 3 nested for loops (n) (n2) (n2) n5
   6. 3 nested for loops (n) (n2) (n2) n5
6. Big O notation
   1. 1 for loop n
   2. 2 for loops n
   3. 1 for loop log(n)
7. .5ms for 100 elements. How long for 1000 when
   1. Linear 5
   2. N log N
   3. Quadratic 50
   4. Cubic 500
8. .5ms for 100 elements. How many after 2 minutes when
   1. Linear
   2. Quadratic
   3. Cubic