H.W. 5

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Contents

1

a) $\Theta(N)$. All operations are order N
b) $\Theta(N)$. The output is length $N+1$.
c) Yes.
d) $\Theta(N^2)$
e) $\Theta(N)$
f) No.
g) $\Theta(N)$
h) $\Theta(N)$
i) $\Theta(N^2)$
j) $\Theta(logN)$
k) $\Theta(N^2)$
l) $\Theta(N^2)$
m) $\Theta(N^{log_2 3})$
n) $\Theta(N^{log_2 3})$
o) $\Theta(N^{log_2 3})$
p)

```
KTHROOT(A, K, N)
   tolerance = 0.1^N
   guess = N/2
   if n<0:
      lower = n
      upper = 0
   else:
      lower = 0
      upper = n
   while guess^K - A > tolerance :
      if guess^K- A > 0:
         lower = guess
         guess = (lower+upper)/2
      else:
         upper = guess
         guess = (lower+upper)/2
   return guess
```

2

a) $\Theta(N^{log_2 3})$
b) $\Theta(RC/N)$
c) $\Theta(RC/N$ d) 0 is a fixed point. 1 is a fixed point. 2 is not. 3 is not. m-2 is not. m-1 is. e) 1. False
2. False
3. False
4. True
5. False
f) 1. False
2. False
3. True
4. False
5. True

3

a) fastmul
b) 93496/172
c) $\Theta(N^2)$
d) $\Theta(N^2)$
e) 1. True
b. True
c. False
d. True
e. False
f. False
f) $\Theta(RC/N)$