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C-3.40

$c_1 log(f(n)) \leq log_b f(n) \leq c_2 log(f(n))$

$(c_1 log(f(n)) \leq \frac{log\, f(n)}{log\, b} \leq c_2 log(f(n)))$ log(b)

$log(f(n)) \leq \frac{log\, f(n)}{log\, b} \leq c_2 log(f(n))$

C-3.50

a) Use two for/while loops
b) Store the value of x^i , multiply it by x after each loop, and update.
c) O(n)

R-3.17

$(n+1)^5 \leq c \bullet n^5$ when c>1 and $n \geq n_0 = 1$ so $(n+1)^5$ is O(n^5)

C-4.20

```
def foo(S,k):
    if len(S) <=1:
        return S
    h = S[0]
    if h<=k:
        return [h] + foo(S[1:],k)
    else:
        return foo(S[1:],k) + [h]
```

The runtime is O(n).

C-4.10

```
def foo(n,c=-1):
    if n==0:
        return c
    return foo(int(n/2),c+1)
```