

Focs HW 14

I)

a. $367n + 1098$ vs $2n$, is example problem

b. $n_0 = 3$
 $R = 1$

$$n^2 + 2n + 6 = 6n^2 - 25$$

$$0 = 5n^2 - 2n - 19$$

c. There are none: n^3 grows much faster than n^2 , so for any multiple you choose, shortly afterwards n^3 will pull ahead again.

d. $n = \text{anything}$?
 $R = 942$

e. $n = 1$ $3^n > 2^n$, always
 $R = 1$

f. There are no values for which $\frac{d f(n)}{d n} \leq R \frac{d g(n)}{d n}$, forever,
so we can't pick a value where 2^n will grow
equally or faster

g. $\frac{d \log_2 n}{d n} = \frac{1}{n}$
 $\frac{d \log_{10} n}{d n} = \frac{1}{n \log(2)}$

$n = 2$
 $R = 5$

h. $\frac{d}{d x} (\log_{10}(n^2)) = \frac{2}{x \log(2)}$

$n = 2$
 $R = 1$

II)

a. array: 1
list: 1

b. array: 1
list: 7

c. array: 1 (if not reallocating memory (add at end))
list: 1 (add at beginning)

d. array: $n-5$
list: 5

e. ~~array~~ array: n
list: n

f. array: n
list: n

Linked list: last node ^{location} could be useful for some purposes (length for _{others, too})

g. array: 1
list: 1

h. array: random element: n -location
final element: 1
penultimate: 2

list: random: n -location (kind of)
final: 1
penultimate: $n-1$

i. array: present - 2
not present - 2

list: present - 2
not present - 2

← assuming
storing of last
element, other
 n