Subject: Quiz 1

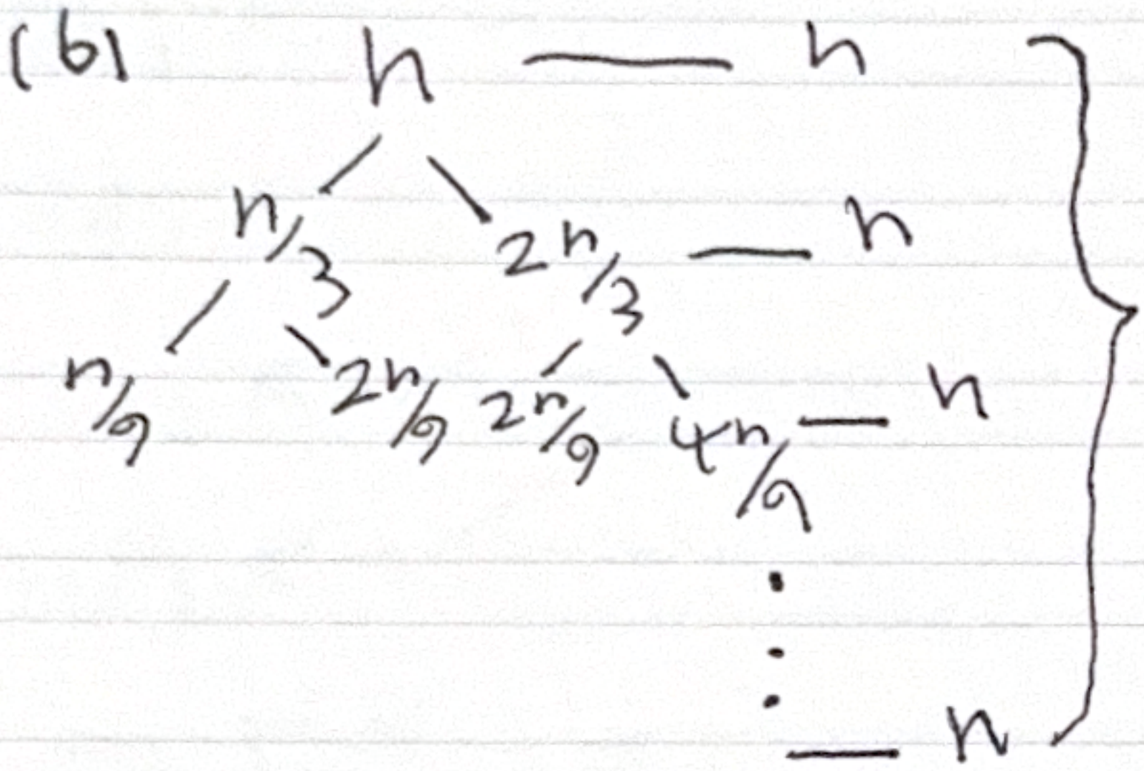
Year: Month: Date:

Problem 1 Benyamin Lazayeri

Problem 2

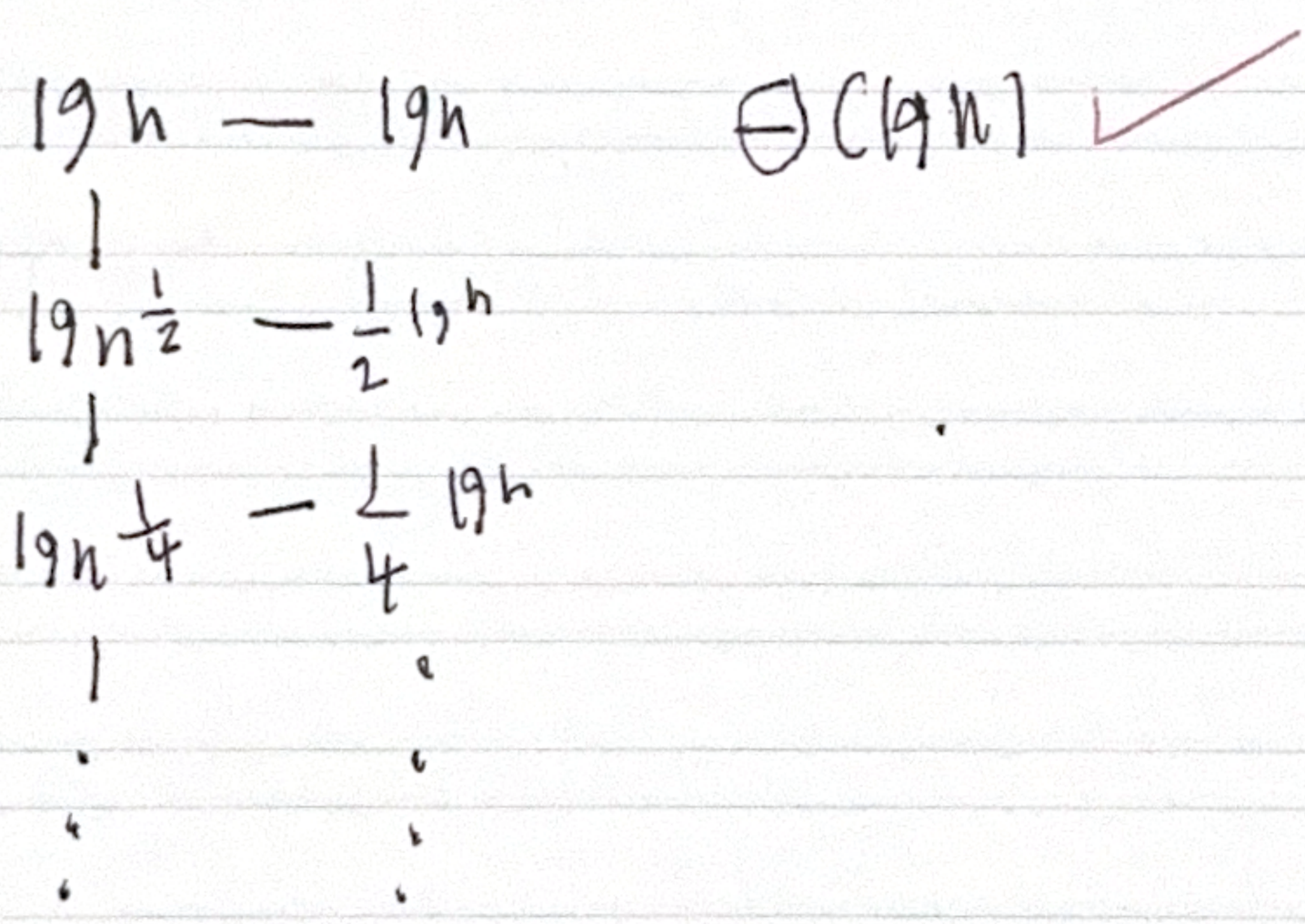
(a) $f_1, f_5, f_3, f_8, f_7, f_6, f_4, f_2$ ✓

(b)



✓

(c)



✓

Subject:

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Problem 3

(a) F ✓

(b) T ✓

(c) F ✓

(d) F ✗ -2

(e) F ✓

(f) F ✓

(g) T ✗ -2

(h) T ✗ -2

(i) T ✓

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Problem 4 −20

(a) $T(m,n) = 3n + T(m/2, n) = \Theta(n \lg m)$ ×

(b) The algorithm is correct. ×

We provide a 2 part Proof.

1. The Algorithm will terminate.

each Sub Prablem has size

$\lfloor \frac{m}{2} \rfloor \times n$ or $m - \lfloor \frac{m}{2} \rfloor \times n$

So either returns or ~~negatively~~ empty.

for empty, $m=1$ —> max will be Peak ✓

2. The returned Value will be

Peak. assume for ※ it being

Passed up stops being peak —> b is

adjacent to ~~on~~ middle column s.t. $a<b$ and

c is max on there —> $b<c$ and

d is c neighbor $d>c$ but a is max $a>d$ ※ ✓ □

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Problem 5

(a) 得 $\binom{n}{k}$ leaves.

$$\lg\binom{n}{k} = n\lg n - n\lg n + k\lg n - k\lg k = k\lg n/k$$

(b) divide into $n/2$, test, recurse into positive worst case $k\lg n/k$.

Problem 6 dict = {}

(a) for i in multisets(k, P):
dict[sum(i)] = i

return dict[S]

dict = {}

(b) for i in multisets($k/2$, P):
dict[sum(i)] = i

for i in multisets($k/2$, P):
if S-sum(i) in dict: S-sum(i)
return i + dict[ ]

c) $O(k \cdot n^{k/2})$

Subject:

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Problem 7

(a) if A[i] < min:
min = A[i] ✓

(b) ~~Binary search for MA[j] < A[j]~~ ✗

-15

7

~~9~~ 12. = 65%