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HW#8 Written
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(1) (a) 1 - 2 + 3 ^ 2

	stack	output
1		1
-	-	
2	-	1 2
+	~~-~~ popped	1 2 -
	+	
3	+	1 2 - 3
^	+ | ^	1 2 - 3
2	+ | ^	1 2 - 3 2
EOL	+ | ~~^~~ popped	1 2 - 3 2 ^
	~~+~~ popped	1 2 - 3 2 ^ +

(b) (2 ^ 3) ^ 2

	stack	output
(	(	
2	(	2
^	(| ^	2
3	(| ^	2 3
)	POP EVERYTHING	2 3 ^
^	^	2 3 ^
2	^	2 3 ^ 2
EOL		2 3 ^ 2 ^

(c) $2 \wedge 3 \wedge 2$

	stack	output
2		2
^	^	2
3	^	23
^	^ ^	23
2	^ ^	232
EOL		232^^

(d) $(2+6) / 3 - (32 + 4 * 7) * 2$

	stack	output
(	(	
2	(	2
+	(+	2
6	(+	26
)		26+
/	/	26+
3	/	26+3
-	-	26+3/
(	- (	26+3/
32	- (	26+3/32
+	- (+	26+3/32
4	- (+	26+3/32 4
*	- (+ *	26+3/32 4
7	- (+ *	26+3/32 4 7
)	-	26+3/32 4 7 * +

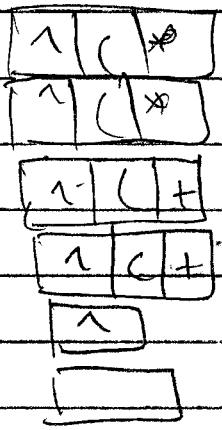
*	[- | *]	2 6 + 3 / 3 2 4 7 * * +
2	[- | *]	2 6 + 3 / 3 2 4 7 * * + 2
EOL	[ ]	2 6 + 3 / 3 2 4 7 * * + 2 * -

(e) 3 + 2 - 4 + 5

	Stack	output
3	[ ]	3
+	[+]	3
2	[+]	3 2
-	[-]	3 2 +
4	[-]	3 2 + 4
+	[+]	3 2 + 4 -
5	[+]	3 2 + 4 - 5
EOL	[ ]	3 2 + 4 - 5 +

(f) (3+2) ^ 4 ^ (3 * 2 + 4)

	Stack	output
(	[( ]	
3	[( ]	3
+	[(| +]	3
2	[(| +]	3 2
)	[ ]	3 2 +
^	[^]	3 2 +
4	[^]	3 2 + 4
^	[^]	3 2 + 4 ^
(	[^ | ( ]	3 2 + 4 ^
3	[^ | ( ]	3 2 + 4 ^ 3



*	^ (*	3 2 + 4 ^ 3
2	^ (*	3 2 + 4 ^ 3 2
+	^ (+	3 2 + 4 ^ 3 2 *
4	^ (+	3 2 + 4 ^ 3 2 * 4
)	^	3 2 + 4 ^ 3 2 * 4 +
EOL		3 2 + 4 ^ 3 2 * 4 + ^

2)
a) 4 2 + 3 3 ^ -

Input	Stack
4	4
2	4 2
+	6
3	6 3
3	6 3 3
^	6 27
-	-21

b) 3 2 ^ 3 2 * -

Input	Stack
3	3
2	3 2
^	9
3	9 3
2	9 3 2
*	9 6
-	3

c) 4 2 3 * - 3 2 ^ - 6 +

Input	Stack
4	4
2	4 2
3	4 2 3
*	4 6
-	-2
3	-2 3
2	-2 3 2
^	-2 9
-	-11
6	-11 6
+	-5

d) 4 3 + 2 * 1 –

Input	Stack
4	4
3	4 3
+	7
2	7 2
*	14
1	14 1
-	13

e) 3 5 * 1 + 4 / 6 +

Input	Stack
3	3
5	3 5
*	15
1	15 1
+	16
4	16 4
/	4
6	4 6
+	10

3.

```
enum TokenType { EOL, VALUE, OPAREN, CPAREN, EXP, MOD, MULT, DIV, PLUS,
MINUS };

vector PREC_TABLE =
{
{ 0, -1 }, { 0, 0 }, // EOL, VALUE
{ 100, 0 }, { 0, 99 }, // OPAREN, CPAREN
{ 6, 5 }, // EXP
{ 3 , 4 }, { 3, 4 }, { 3, 4 }, // MOD, MULT, DIV
{ 1, 2 }, { 1, 2 } // PLUS, MINUS
};
```

4.

Output:

4

4

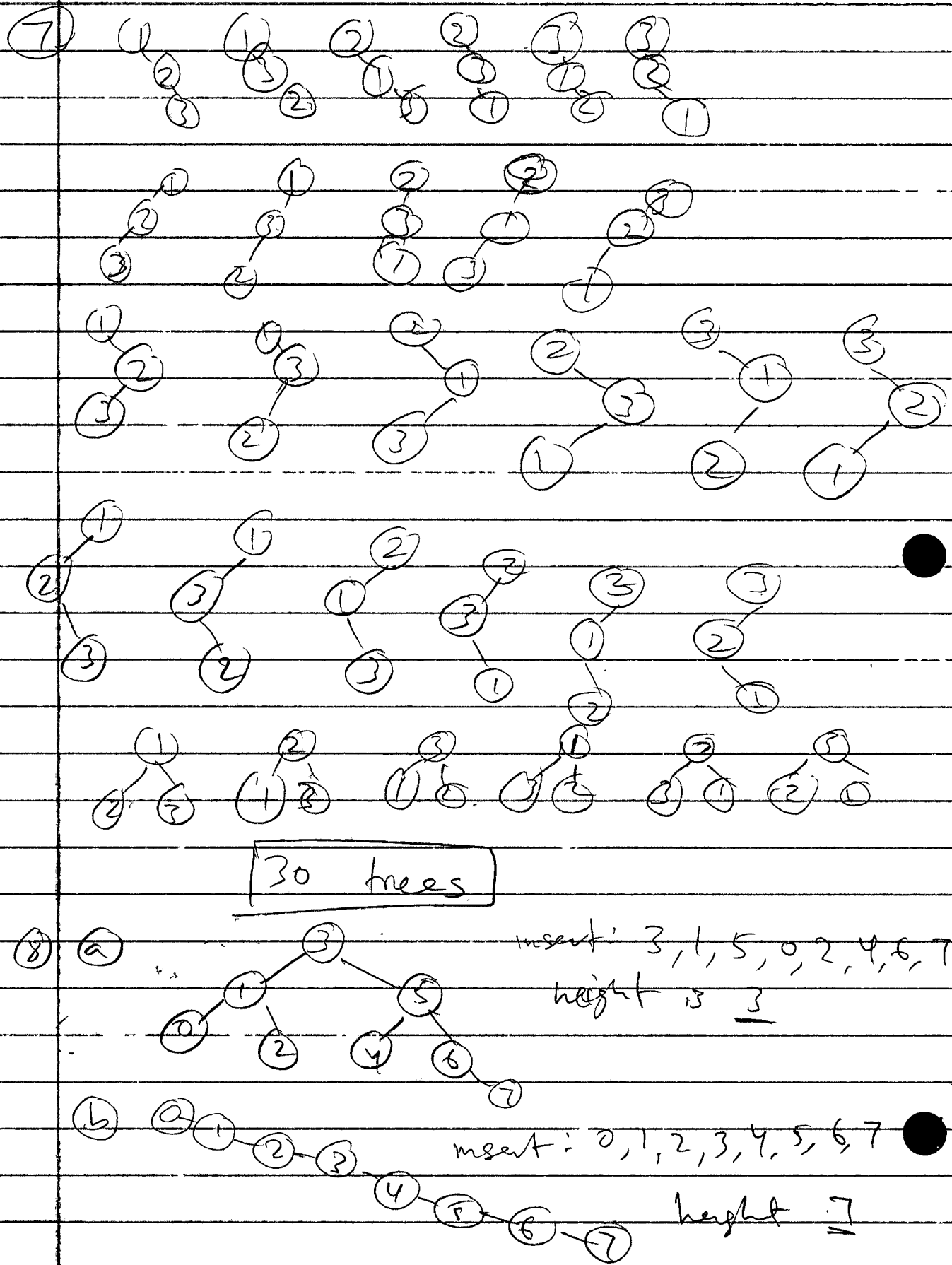
5

Stack (top to bottom): DIV PLUS EOL

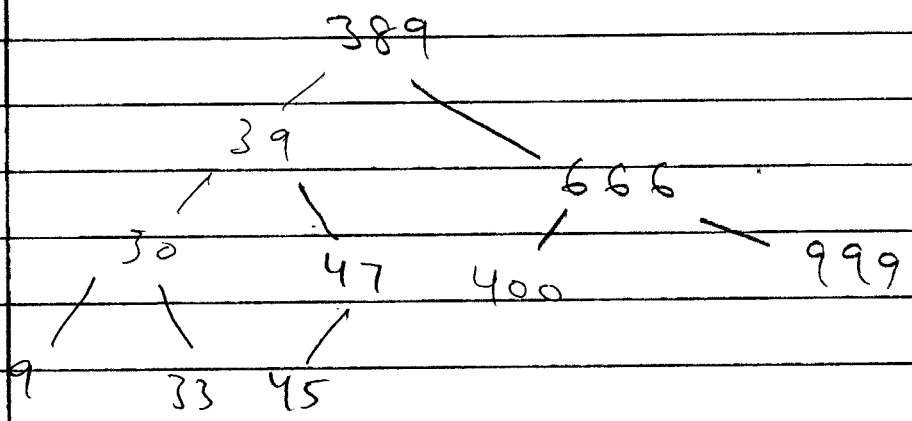
5)

a)*
b)-
c)4,5,8,3
d)*,+,-
e)1
f)2
g)7
h)4, -
i)+
j) (((5-8) + 4)*3)
k) * + 4 – 5 8 3
l) 5 8 – 4 + 3 *

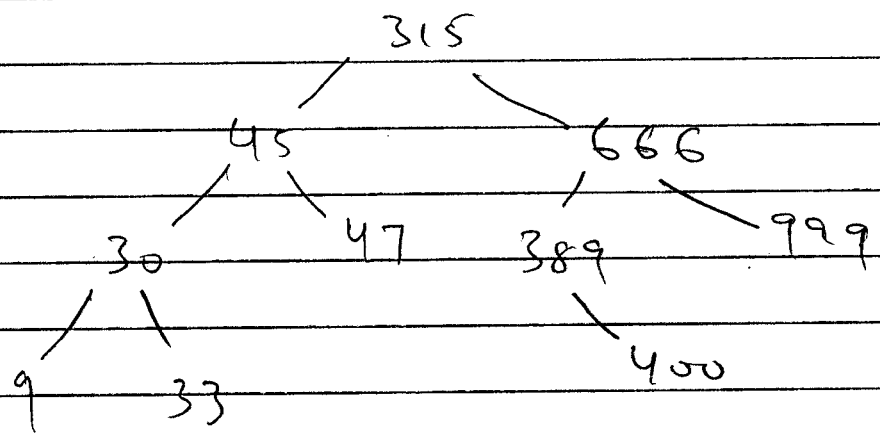
6. O(h)


30 trees
(8) (a)
insert: 3, 1, 5, 0, 2, 4, 6, 7
height is 3
(b)
insert: 0, 1, 2, 3, 4, 5, 6, 7
height 7

9. (a) after 315 removed



(b) after 39 is removed from original



(c) after 398 added from original