

Math 322

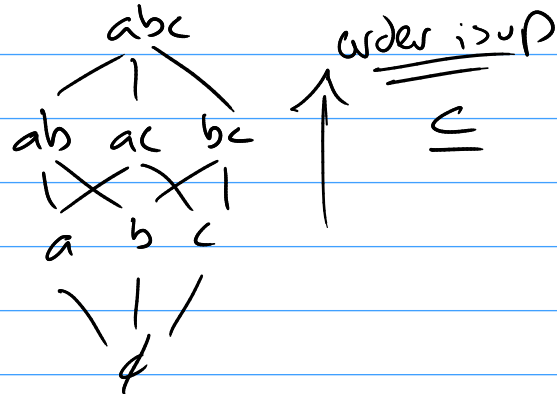
Q's

13.1 2d

$\mathcal{P}(\{a, b, c\}), \subseteq$

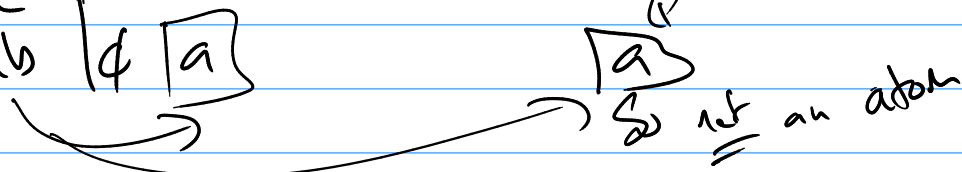
"easy" way

Atoms $\{a\}, \{b\}, \{c\}$



an atom "a" $X \cap a = a$ or $X \cap a = \emptyset$

\cap	\emptyset	a	b	c	ab	ac	bc	abc
a	\emptyset	a	\emptyset	\emptyset	a	a	\emptyset	a
b	\emptyset	\emptyset	b	\emptyset	b	\emptyset	b	b
c	\emptyset	\emptyset	\emptyset	c	\emptyset	\emptyset	c	c
ab	\emptyset	a	b	\emptyset	ab	a	b	ab



2c $\{P(A); \cup, \cap, \subset\}$

Set S is an atom if for every set T $T \cap S = S$ or $T \cap S = \emptyset$

then $a \in x$ means $S \subseteq T$

(1c)

tech #1

$$g(x_1, x_2) = x_1 \vee x_2$$

expansion?

(focus on 1's)

(focus on 0's)

Minterm

maxterm

x_1	x_2
0	0
0	1
1	0
1	1

$x_1 x_2$

0

1

1

1

↓

← $(x_1 \vee x_2)$

← $(\bar{x}_1 \wedge x_2)$

← $(x_1 \wedge \bar{x}_2)$

← $(x_1 \wedge x_2)$

Minterm expansion

$$g = (\bar{x}_1 \wedge x_2) \vee (x_1 \wedge \bar{x}_2) \vee (x_1 \wedge x_2)$$

$$g = (\bar{x}_1 x_2) + (x_1 \bar{x}_2) + (x_1 x_2)$$

Maxterm expansion

$$g = (x_1 \vee x_2) = (x_1 + x_2)$$

tech #2

use boolean algebra laws

$$g = (x_1 \vee x_2) = (x_1) \vee (x_2)$$

$$g = (x_1 \vee 0) \vee (x_2)$$

$(x_2 \wedge \bar{x}_2)$

$$= (x_1 \vee (x_2 \wedge \bar{x}_2)) \vee (x_2)$$

$$= (x_1 \vee x_2) \wedge (x_1 \vee \bar{x}_2)$$

$$= (x_1 \wedge 1) \vee (x_2)$$

↑
 $x_2 \vee \bar{x}_2$

$$\mathcal{S} = (\underbrace{x_1 \wedge (x_2 \vee \bar{x}_2)}) \vee (x_2)$$

$$\mathcal{S} = (x_1 \wedge x_2) \vee (x_1 \wedge \bar{x}_2) \vee (x_2)$$

$$\mathcal{S} = (x_1 \wedge x_2) \vee (x_1 \wedge \bar{x}_2) \vee (\underbrace{(1 \wedge x_2)}_{(x_1 \vee x_1)})$$

$$\mathcal{S} = \underline{(x_1 \wedge x_2)} \vee (x_1 \wedge \bar{x}_2) \vee \underline{(x_1 \wedge x_2)} \vee (\bar{x}_1 \wedge x_2)$$

$$\boxed{\mathcal{S} = (x_1 \wedge x_2) \vee (x_1 \wedge \bar{x}_2) \vee (\bar{x}_1 \wedge x_2)}$$

Exam

12 probs @ 10pts
110pts = 100%

ch 10 Trees

ch 13 Boolean Algebra

2 probs

10.1 Trees

① Make a tree (all types of trees)
for a set of vertices

② Proof of parts of th^m 10.1.11

like # 3

2 probs

10.2 Spanning Trees

① Find spanning tree using Prim's Algorithm

② using Dijkstra's Algorithm

10.3

Rated trees

- know
- ① finding false can
 - ② sort of things
 - ③ game tree

I'll pick two

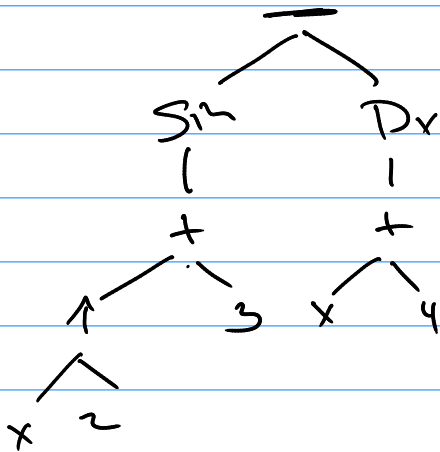
10.4

Tree traversal

① Math \rightarrow tree \rightarrow

prefix
infix
postfix
Notations

(ex) $\sin(x^2+3) - D_x [x+4]$



infix:
postfix:
prefix:

ch 13 Boolean Algebra

13.1

Posets (1 prob)

① given poset \rightarrow draw Hasse Diagram

ms q's

13.2 Lattices

(1 prob)

- ① operation table for a lattice of 4 elements

13.3 / 13.4 / ~~13.5~~ / 13.6

Boolean Algebra

3 probs

- ① $\mathcal{P}(\{a, b\})$ with \subseteq
write all operation tables $\wedge, \vee, ^c$
 - ② Find Atoms of $\{B; \vee, \wedge, ^c\}$
 - ③ Minterm / Maxterm expansions
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