

6/8

Tuesday, September 08, 2009
1:30 PM

Set

every jet has a
universe

$\{ \text{matt, kristin, sean, connor, bart, erin} \}$

$S = \{ \text{"students of 101kb in 2nd row from door"} \}$

$N = \{ 35, 33, 71 \}$

$W = \{ \text{"women in row 2"} \}$

$W \subset S$

$w = \{ \text{erin, kaitlin} \}$

$w \subset W$... erin who

$W = \{p \mid \text{"p is a woman who is sitting in row 2"}\}$

$|S| = \text{number of members of } S$
 $= \text{cardinality of } S$
 $= 6$

$|W| = 2$

$N = \{ \text{"students not from Earth"} \}$

$|N| = 0 \quad \emptyset = N$

$\{ \}$

HW read 5.1 & 5.2

pg 273

prob 20-25

pg 274 Prob 32-41

pg 291 ex 1,2

proper
subset

$$X \subset Y$$

$$|X| < |Y|$$

subset

$$X \subseteq Y$$

$$|X| \leq |Y|$$

9/10

Thursday, September 10, 2009

1:27 PM

NR1.

after 9/10

9/11

each set
is worth $\frac{20}{100}$

max 120

up to 2 per
article

1 set: Obama
supporters

universe: people
why: explain who
isn't in the deep
south.

2

Due 9/24

pg 273
prob 22

$M = \{ \text{January, February, March, April, September, ...} \}$

october,
November,
December}

Jerlie

Orgust

21 {4,5,6,7,8,9}

33 T everything in
B B IN A

35 F $6 \in A$
 $6 \notin C$

37 T $1 \in D$
 $3 \in D$

na r

$\exists z \in D$

39 T

Power set of A

$P(A)$ contains
all the subsets of
A including A

$$A = \{x, z\}$$

$$P(A) = \{ \emptyset, \{x\}, \{z\}, \{x, z\} \}$$

$$|\emptyset| = 0$$

$$|\emptyset| = 0$$

$$\mathcal{P}(\emptyset) = \{\emptyset\}$$

$$|\mathcal{P}(\emptyset)| = 1$$

$$B = \{b\}$$

$$|B| = 1$$

$$\mathcal{P}(B) = \{\{b\}, \emptyset\}$$

$$|\mathcal{P}(B)| = 2$$

each element doubles
the power set

HW

pg 274-275 42-47

HW
pg 274-275 42-47

read 5.2
pg 282 prob 25,26

9/15

Thursday, September 10, 2009

1:27 PM

pg 274

ex 32 ~~XF~~

$7 \in A$ $7 \notin B$

34 F $9 \in D$ $9 \notin A$

36 T 1 appears in \mathcal{P}

38 ~~X~~ \neq $\{1, 3\}$ does

A $\mathcal{P}(A)$ not appear in \mathcal{D}

\emptyset

$\{\emptyset\}$

\leftarrow

$\{a\}$

$\{\emptyset, \{a\}\}$

\leftarrow

$\{a, b\}$

$\{\emptyset, \{a\}, \{b\}, \{a, b\}\}$

\leftarrow

$\{a, b, c\}$

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

|

..

$$2^k \quad | \quad \underbrace{2 \cdot 2 \cdot 2 \cdots 2}_{k \text{ times}}$$

$$|P(A)| = 2^{|A|}$$

$$6 = |A|$$

$$|P(A)| = 2^6 = 64$$

pg 274

$$43 \quad 2^3 = 8$$

$$45 \quad 2^6 - 1 = 63$$

connectives
complement

everything in

the universe

not in the set

$M = \{\text{"male students"}\}$

$M = \{\text{male students}\}$

$M^c \leftarrow \text{complement of } M$

Intersection

HW pg 282
Prob 25 - 29

9/17

pg 272
prob 42
3 elements
in B

prob 44 $P(A)$
 $2^4 = 16$

$A = \{1, 3, 5, 6\}$

$P(A) = \{\emptyset, \{1\}, \{3\}, \{5\}, \{6\}, \{1, 3\}, \{1, 5\}, \{1, 6\}, \{3, 5\}, \{3, 6\}, \{5, 6\}, \{1, 3, 5\}, \{1, 3, 6\}, \{1, 5, 6\}, \{3, 5, 6\}, \{1, 3, 5, 6\}\}$

pg 281
ex 2

$C \cap D = \{2\}$

U

ex 1
 $C \cup D = \{1, 2, 3, 4, 5, 6\}$

$X = \{a, b, c, d\}$

$V = \{a, b, c, d, e\}$

$X \setminus V = \{c, d, e, j, q, w\}$

— = set difference

$X - V = \{b, c, d\}$

P C I U D

a o n l
r m i t
n p n f

$B \cup D = \{2, 4, 6\}$

$D' = \{1, 5, 6, 7\}$

$B \cup D' = \{1, 2, 4, 5, 6, 7\}$

$A \cup B$

$\{1, 2, 3, 4, 5, 6, 7\}$

H W pg 282-34

n
+

$(A \cup B)'$

$$(A \cup B) = \emptyset$$

9/27

Tuesday, September 22, 2009
1:33 PM

$$\text{pg } 282$$
$$25 \quad \{3, 7\}$$

PCI VD

$$D' = \{4, 5, 6, 7, 10, 13\}$$

$$D - B = \{4, 5, 6, 13\}$$

$$A' = \{2, 5, 6, 8, 9\}$$

$$B' = \{1, 2, 3, 4, 5, 6, 9\}$$

$$A' \cap B' = \{2, 5, 6, 9\}$$

$$31 \quad B' = \{1, 2, 3, 4, 5, 6, 9\}$$

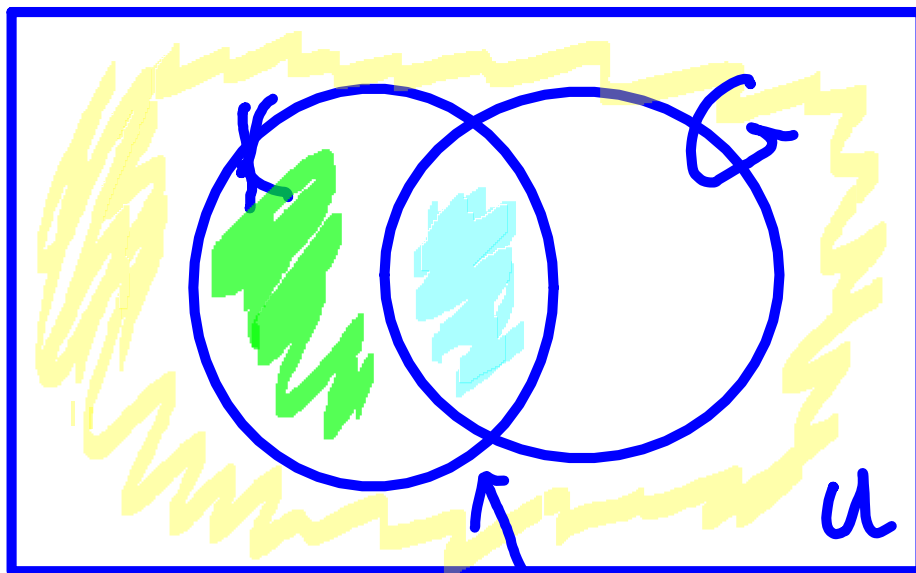
$$A \cap B' = \{1, 3, 4\}$$

$$C' = \{1, 2, 4, 6, 8, 9, 10\}$$

$$C' \cap D = \{2, 8, 9\}$$

$$(A \cap B') \cup (C' \cap D) = \{1, 2, 3, 4, 8, 9\}$$

Venn Diagrams



→ universe set

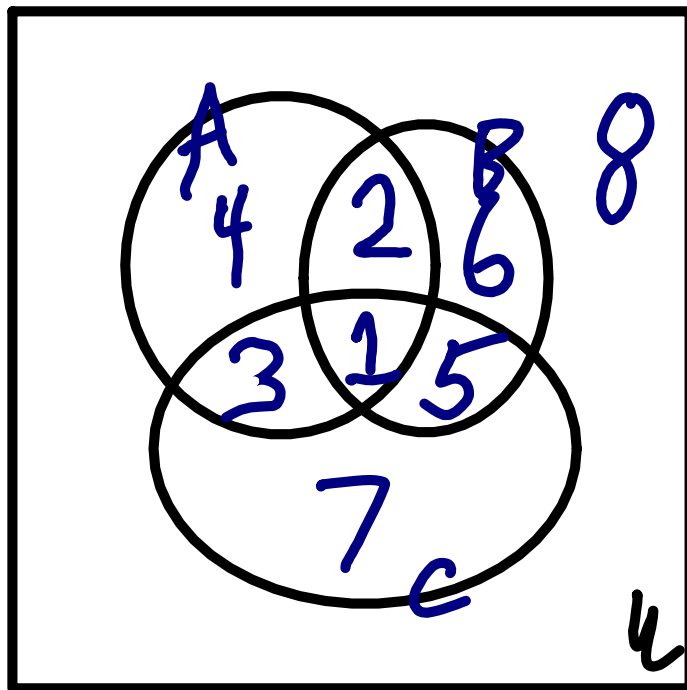
$(K \cup G)$

$K \cap G$

(KUG)

KAG

K-G



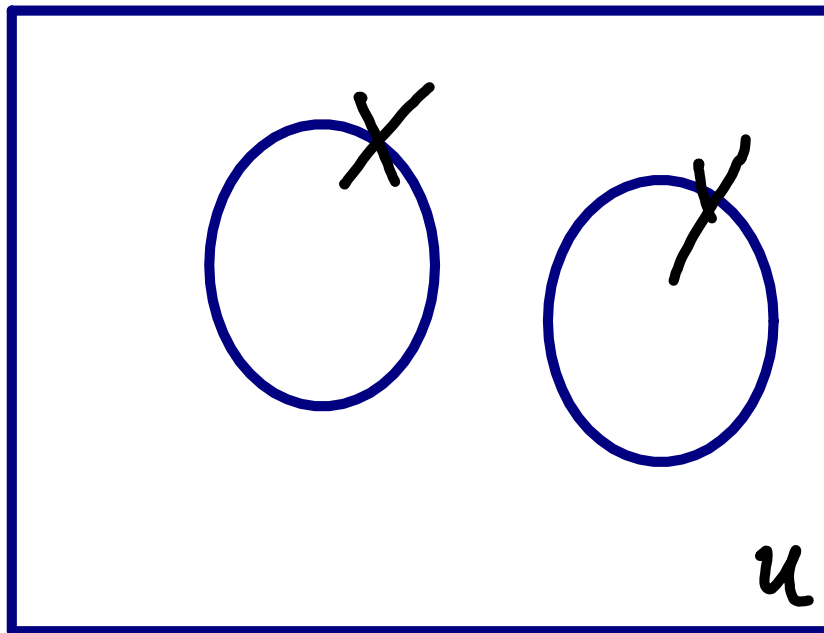
$$U = \{1, 2, 3, 4, 5, 6, 7, 8\}$$

$$A = \{1, 2, 3, 4\}$$

$$B = \{1, 2, 5, 6\}$$

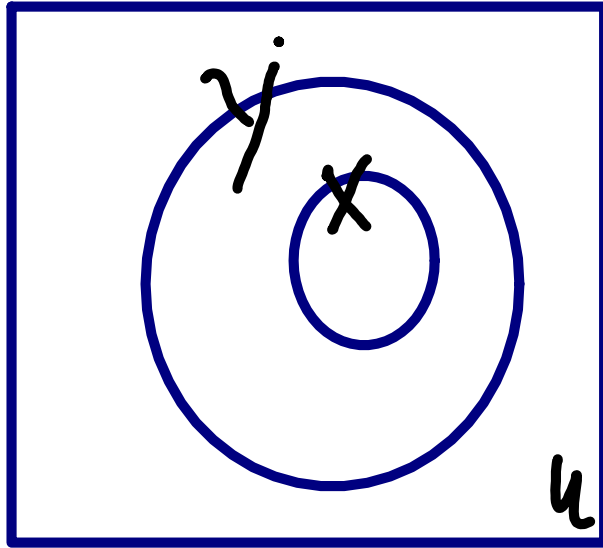
$$C = \{1, 3, 5, 7\}$$

$$C = \{1, 3, 5, 7\}$$

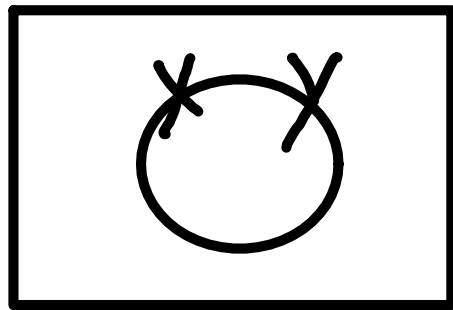


X and Y are
disjoint

$$X \cap Y = \emptyset$$



$$X = Y$$

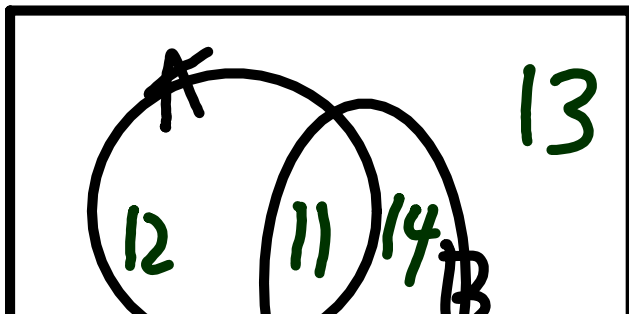


Read 5.3

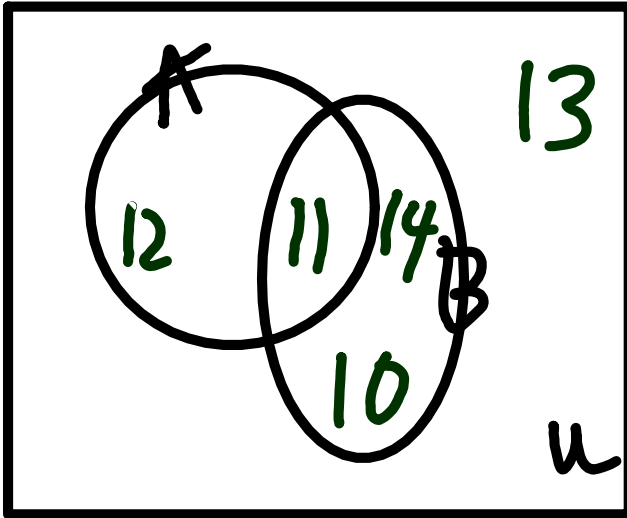
HW pg 293

prob 39-49

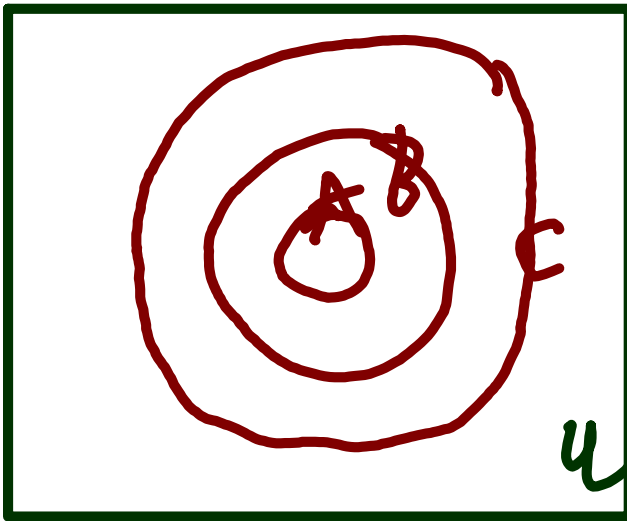
39



51



45



9/24

Thursday, September 24, 2009
1:15 PM

Report 2 Ave
10/15

Unions or Intersections

2 sets from the
same universe

Article talks about
union or intersection

Universe: :

set 1 :

set 2 :

Union Intersection

Why

at least 2 of
each

2 ops each

\cup or \cap

into 2 per article

up to 2 per article
articles from 9/25
exam 10/6

pg 282
prob 34 $P \subset I \cup D$

$$C' = \{2, 4, 6, 8, 9, 10\}$$

$$A' = \{2, 5, 6, 8, 9\}$$

$$D - C' = \{3\} \checkmark$$

$$B - A' = \{7, 10\} \checkmark$$

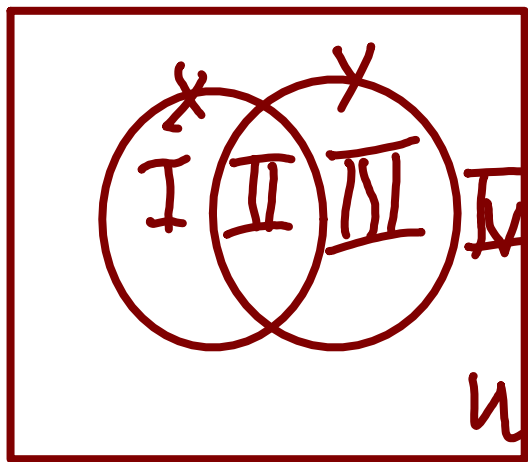
$$(D - C') \cap (B - A') = \emptyset$$

$$33 \quad A' = \{2, 5, 6, 8, 9\}$$

$$B' = \{1, 2, 3, 4, 5, 6, 9\}$$

$$A' \cap C = \{5\}$$

$$\begin{aligned}
 A' \cap C &= \{5\} \\
 B' \cup D &= \{1, 2, 3, 4, 5, 6, 8, 9\} \\
 (A' \cap C)' &= \{1, 2, 3, 4, 6, 7, 8, 9, 10\} \\
 (A' \cap C) - (B' \cup D) &= \{7, 10\} \\
 [(A' \cap C) - (B' \cup D)]' &= \{1, 2, 3, 4, 5, 6, 8, 9\}
 \end{aligned}$$



$$X - Y = I \quad U = I, II, III, IV$$

$$X = I, II$$

$$Y = II, III$$

$$X \cup Y = I, II, III$$

$$(X \cup Y)' = IV$$

HW pg 294
50-59 (0-6)

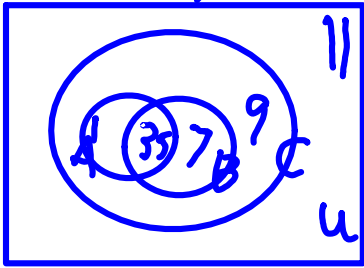
10/1

pg 293

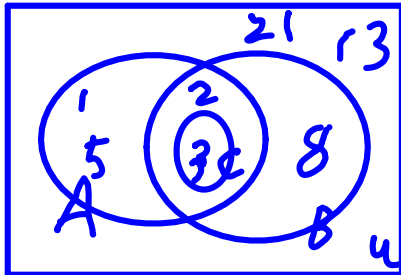
Thursday, October 01, 2009

1:29 PM

42



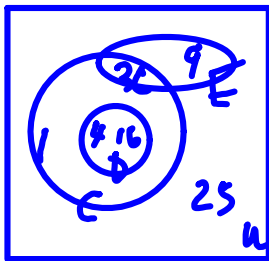
43



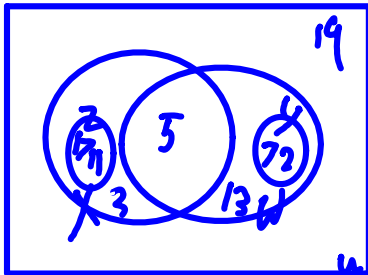
pg 290

ex

2



5



$Y \subset W$ $Z \subset X$

$Y \subset Z'$

$W \subset Z'$ $X \subset Y'$

pg 294

51

$A = I, II$

$P \subset I \cup D$

$A \cap B = II$

II, III

$B =$

$$55 \quad B' = I, IV$$

$$A - B' = II$$

$$65 \quad A = I \ II \ III \ IV$$

$$B = I \ II \ V \ VI$$

$$B' = II \ IV \ VII \ ~~III~~$$

$$A - B' = I \ II$$

$$A \cap B = I \ II$$

$$A - B' = A \cap B$$

HW read 5.4

10/13

Tuesday, October 13, 2009
1:34 PM

pg 303

$$(A \cup B)' = A' \cap B'$$

prob 16

$$A = \underline{I} \ \underline{II} \ \underline{III} \ \underline{IV}$$

$$A \cup B = \underline{I} \ \underline{II} \ \underline{III} \ \underline{IV} \quad B = \underline{I} \ \underline{II} \ \underline{V} \ \underline{VI}$$

V VI

$$(A \cup B)' = \underline{VII} \ \underline{VIII}$$

$$A' = \underline{V} \ \underline{VI} \ \underline{VII} \ \underline{VIII}$$

$$A' \cap B' = \underline{VII} \ \underline{VIII} \quad B' = \underline{III} \ \underline{IV} \ \underline{VII} \ \underline{VIII}$$

pg 302 ex 3

$$A \cap B = \underline{I} \ \underline{II}$$

$$(A \cap B)' = \underline{III} \ \underline{IV} \ \underline{V} \ \underline{VI} \ \underline{VII} \ \underline{VIII}$$

$$C = \underline{I} \ \underline{III} \ \underline{V} \ \underline{VII}$$

$$(A \cap B)' - C = \underline{IV} \ \underline{VI} \ \underline{VIII}$$

$$A' \cup B' = \underline{III} \ \underline{IV} \ \underline{V} \ \underline{VI} \ \underline{VII} \ \underline{VIII}$$

$$C' = \underline{II} \ \underline{IV} \ \underline{VI} \ \underline{VIII}$$

$$(A' \cup B') \cap C' = \underline{IV} \ \underline{VI} \ \underline{VIII}$$

$$C' = \overline{IIIV} \overline{VI} \overline{VIII}$$

$$(A' \cup B') \cap C' = \overline{IV} \overline{VI} \overline{VIII}$$

Statement	Reason
1) $(X')'$	GIVEN
2) X	L1 $A=X$

simplifiers
right side is simpler

↳ 6-10

rearrangers

↳ 2-5 11

$B \cup (C \cup B')$ given
 $B \cup (B' \cup C)$ L2 $A=C$ $B=B'$
 ... 11 13 $A=B$ $B=B'$ $C=C$

HW (BUB / UUC) LA=B
pg 303-34
prob 20-22 .

10/20

Tuesday, October 20, 2009

1:32 PM

pg 303
ex 20

a) L11 $A=P$ $B=R$,

b) L5 $A=P$ $B=R'$
L1 $A=R$

c) L3 $A=P$ $B=R$ $C=R'$

d) L8 $A=R$

e) L10 $A=P'$

ex 21

a) L5 $A=P$ $B=S'$

L1 $A=S$

b) L4 $A=S' \cap B=P'$ $C=S$

c) L8 $A=S'$ L1 $A=S$

d) L10 $A=S' \cap P'$

$$d) L10 A = S \cap P'$$

$$e) L11 A = S' \quad B = P$$

prob 23

$$\frac{A' \cup (B \cap B')}{A' \cup \emptyset}$$

$$A'$$

given

$$L8 A = B$$

$$L10 A = A'$$

pg 302

ex 6

$$B \cap (B' \cup C)$$

$$(B \cap B') \cup (B \cap C)$$

$$\emptyset \cup (B \cap C)$$

$$(B \cap C) \cup \emptyset$$

$$B \cap C$$

given

$$L4 A = B \quad B = B' \cup C$$

$$L8 A = B$$

$$L2 A = \emptyset \quad B = B \cap C$$

$$L10 A = B \cap C$$

HW

pg 304

prob 24-32

pg 304 ex 22

a) L10 $A=C$, $5+(4)=5+4$

b) L10 $A=A'$

c) L11 $A=C$ $B=A'$ L1 $A=A$

d) L5 $A=C$ $B=A$

e) L2 $A=C$ $B=C' \cup A'$

f) L4 $A=C$ $B=C'$ $C=A'$

g) L8 $A=C$

h) L10 $A=C \cap A'$

i) L11 $A=C$ $B=A$

prob 25

$A \cap (A \cup C)$

$(A \cap A') \cup (A \cap C)$

$\emptyset \cup (A \cap C)$

$(A \cap C) \cup \emptyset$

GIVEN

L4 $A=A$ $B=A'$ $C=C$

L8 $A=A$

L2 $A=\emptyset$ $B=A \cap C$

$$\emptyset \cup (A \cap C)$$

$$(A \cap C) \cup \emptyset$$

$$A \cap C$$

$$L2 \quad A = \emptyset \quad B = A \cap C$$

$$L10 \quad A = A \cap C$$

prob 27

$$B' \cap (B \cap A)'$$

$$B' \cap (B' \cup A')$$

$$B' \cap (B' \cup A)$$

$$B'$$

given

$$L5 \quad A = B \quad B = A'$$

$$L1 \quad A = A$$

$$L6 \quad A = B' \quad B = A$$

HW Read 6.2

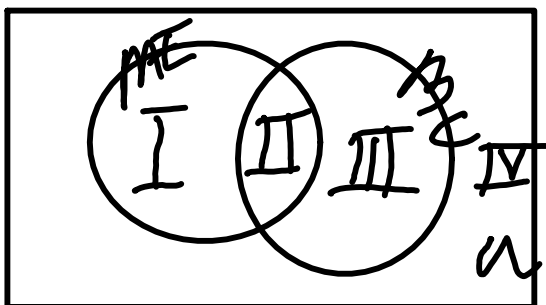
pg 313 ex 1

10/29

r3 due 11/12

exam 2 11/19

pg 329 prob 8



$$20000 = I(11600) + II(2400) + III(5800) + IV(200)$$

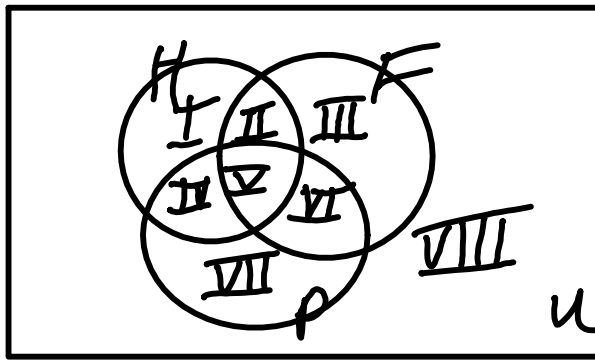
$$14000 = I(11600) + II(2400)$$

$$8200 = II(2400) + III(5800)$$

$$a) IV(200) = 200$$

$$b) I(11600) = 11600$$

pg 328 ex 5



$$\begin{aligned}
 400 &= I(200) + II(50) + IV(80) + V(70) \\
 280 &= II(50) + III(100) + V(70) + VI(60) \\
 390 &= IV(80) + V(70) + VI(60) + VII(130) \\
 50 &= II(50) \\
 130 &= VII(130) \\
 200 &= I(200) \\
 120 &= II(50) + V(70) \\
 700 &= I(200) + II(50) + III(100) + IV(80) \\
 &\quad + V(70) + VI(60) + VII(130) + VIII(\quad)
 \end{aligned}$$

$$a) I(200) + II(50) + III(100) + IV(80) + V(70) + VI(60) + VII(130) = 690$$

$$b) VIII(\quad) =$$

$$c) III(100) = 100$$

$$d) I(200) + II(50) + III(\quad) = (H \cup F) - P$$

$$e) II(50) = 50$$

~' (HNF)-0

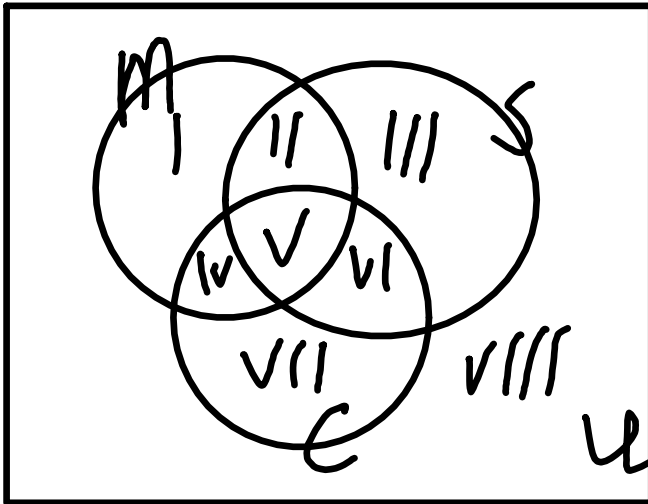
HW 9-14 pg 329-331
read 5.3

11/3

Tuesday, November 03, 2009
1:13 PM

can you read this?

pg 330 prob 12



$$75 = I(5) + II(26) + III(0) + IV(28) + V(2) + VI(1) + VII(13) + VIII(2)$$

$$0 = VIII(0)$$

$$29 = II(26) + III(0) + V(2) + VI(1)$$

$$44 = IV(28) + V(2) + VI(1) + VII(13)$$

$$30 = IV(28) + V(2)$$

$$28 = II(26) + V(2)$$

$$3 = V(2) + VI(1)$$

$$2 = V(2)$$

... \leftarrow probability ... +1

$$2 = \dots$$

a) $I(5)$ $5/75$ probability of only math

b) $I(5) + VII(13) + IV(28) + VIII(0)$
 $= 46$ $46/75$ probability

c) $I(5) + III(0) + VII(13)$
 $= 18$ $18/75$ probability

probability of teaching statistics

$$II(2) + V(2) + VI(1) + IX(0)$$
$$= 29/75 P(S)$$

$$\frac{|S|}{|U|}$$

probability that a math teacher teaches statistics

$$P(S|M)$$

c-conditional probability

$$= \frac{P(S \cap M)}{P(M)} \frac{11(20) + V(2)}{I(5) + 11(20) + V(2) + 1V(2)}$$

$$= \frac{28}{61}$$

$$P(M|C)$$

$$= \frac{N(28) + V(2)}{1V(28) + V(2) + 1V(1) + 1V(13)}$$

$$= \frac{30}{44}$$

$$P(C|M)$$

$$\frac{30}{61} = \frac{1V(28) + V(2)}{1(5) + 11(20) + 1V(28) + V(2)}$$

HW

read 6.3 6.4 6.5

ex 1 from each

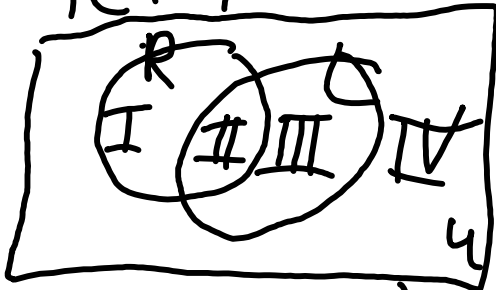
11/10

Tuesday, November 10, 2009
1:34 PM

48 players on
the roster.

36 hit right handed
everyone hits

18 hit left handed
is right handed independent
of left handed



$$48 = I(30) + II(6) + III(12) + IV(0)$$

$$36 = I(30) + II(6)$$

$$18 = II(6) + III(12)$$

$$0 = IV(0)$$

$$48 = I() + II() + III(12)$$
$$- (36 = I() + II())$$

$$12 \approx 111(12)$$

$$P(R) = \frac{36}{48} = \frac{3}{4}$$

$$\rightarrow P(R \cap L) = \frac{6}{48} = \frac{1}{8} \leftarrow$$

$$P(L) = \frac{18}{48} = \frac{3}{8}$$

$$P(R|L) = \frac{P(R \cap L)}{P(L)} = \frac{\frac{1}{8}}{\frac{3}{8}} = \frac{18}{24} = \frac{3}{4}$$

LOGIC

Sets are about nouns
(plural)

logic is about
statements

statements is about
verbs

a = The man ate the cat

r - Obama is the president

b = Obama is the president

c = Hope is yawning

d = The class is bored

e = statements are either true or false

f = we do not necessarily know which

h = Sam will get an A.

j = In 2012 the earth will be destroyed.

we use small letters instead of writing out statements

compound statements are simple statements

are simple statements
combined with connectives
logic has more

\sim =

$C =$ Hope is yawning

$\sim C =$ Hope is not yawning

$C \quad \sim C$

T	F	← truth table
F	T	

$\wedge =$ and

$h =$ Sam will get an A.

$C \wedge h =$ Hope is yawning and

Sam will get an A

for $C \wedge h$ to be true both
must be true

$C \quad h \quad C \wedge h \quad \sim C \vee \sim h \quad \sim(C \wedge h)$

T	T	T	F	F	F
F	T	F	T	T	T
T	F	F	F	F	T
F	F	F	T	F	T

HW
 read: 1 pg 1 / 1
 prob 37-43

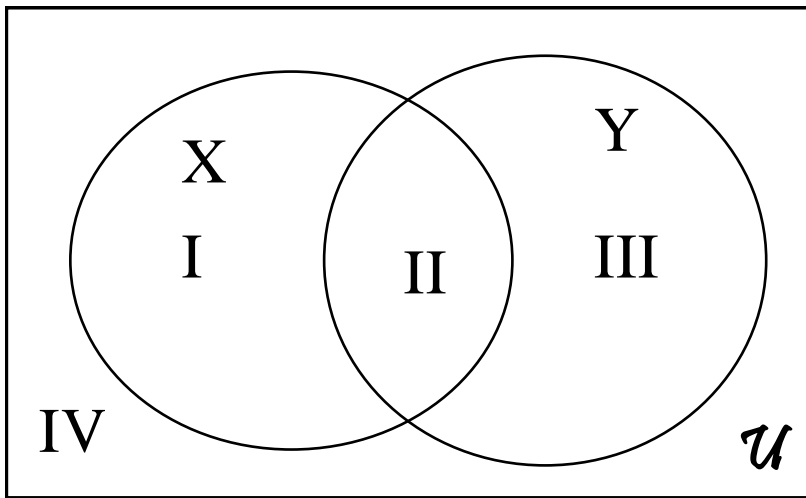
November 09 101 Review Exam 2 A

Show your work on each problem

25 pts

1. Use the regions of this Venn Diagram to show

$$\left((Y - X) \cap \left(Y \cup (Y - X)' \right) \right) = Y \cap X'$$



25 pts

2. Give reasons for these statements and fill in what A,B, and C equals:

Statement	Reason	Variable Assignment
$F - (G - F)$		
$F \cap (G - F)'$		
$F \cap (G \cap F)'$		
$F \cap (G' \cup F')$		
$F \cap (G' \cup F)$		
$F \cap (F \cup G')$		
F		

25 pts

3 Use a statement reason proof (on back) to show

$$\left((Y - X) \cap \left(Y \cup (Y - X)' \right) \right) = Y \cap X'$$

Make sure to show what the variable assignments (A=B=C=) are for each law.

25 pts

4. 50 insects were found in the jungle. 10 of the bugs have purple wings. 20 of the bugs have green heads. 30 of the bugs have red eyes. 4 of the bugs have purple wings and not red eyes. 6 of the bugs have purple wings but not green heads. 10 of the bugs have red eyes and green heads. 2 of them had red eyes, purple wings and green heads. What are the probabilities that:

- A bug has red eyes.
- A bug has a green head but not red eyes and not purple wings.
- A bug with purple wings has a green head.
- A bug has red eyes or a green head.

- e) A purple winged bug has a green head.
- f) Is red eyes independent of green heads?
- g) Is red eyes independent of purple wings?

Pasted from <<file:///J:/CLASS/Fall09/mat101/101E2.docx>>

$(\neg N \wedge V) \rightarrow E$
 $PNAOCB$

Statement 1:
 Statement 2:

\wedge or \vee

Why:

- pg 11
- 38 $P \vee U$
- 40 $N \wedge S$
- 42 $S \wedge \neg m$
- 44 $a \rightarrow w$
- 46 $e \rightarrow e$
- 48 $d \leftrightarrow \neg s$

pg 25

ex 1	P	Q	$\neg Q$	$P \wedge \neg Q$
	T	T	F	F
	F	T	F	F
	T	F	T	T
	F	F	T	T

tautology \leftrightarrow always true

ex 2

P	Q	$P \wedge Q$	$P \rightarrow (P \wedge Q)$
T	T	T	T
F	T	F	T
T	F	F	F
F	F	F	T

ex 7

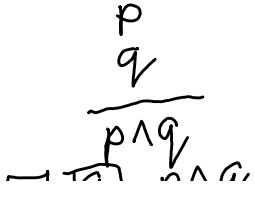
P	$\neg P$	Q	$\neg P \vee Q$	$P \wedge (\neg P \vee Q)$	$[P \wedge (\neg P \vee Q)] \rightarrow P$
T	F	T	T	T	T
F	T	T	T	F	T
T	F	F	F	F	T
F	T	F	T	F	T

tautology!

HW pg 26 prob 11-20

pg 34 prob 11-14

read 2.1



Q
T
T
F
F

$\frac{10}{T}$ $\frac{14}{T}$ $\frac{17}{T}$
*
 $\frac{+}{+}$ $\frac{+}{+}$
HW pg 80 prob 11-12

pg 106 prop 30

S = I speak spanish

P = I speak portuguese

Q = I will take italian

R = visitrome n = visit
venice

(SAP) → Q

NQ V(RAN)

S

P → R
P
T

(SAP) → Q Q

n r

~NQ V(RAN) P → R

T ≠

≠

≠