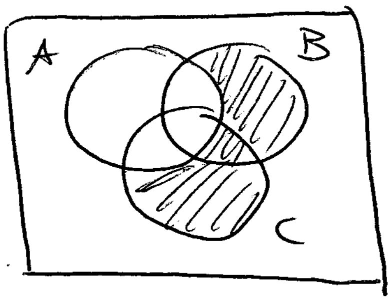
Math 100 Assignment 2 Solutions

2.3 116, 118   2.4 20, 26   2.5 34, 44

2.3
116



in B or in C but not in A

so $(B \cup C) - A$

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

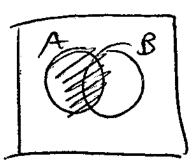
or $(B-A) \cup (C-A)$ or $(B \cap A') \cup (C - A')$

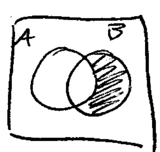
118. $A = B - A$ A - elements in A
$B-A$ elements in B but NOT in A

So given any object in A, it is not in $B-A$ and vice versa
→ no common elements → $A = \emptyset = B - A$ only possibility that works.

If $B - A = B - \emptyset = \emptyset$, then B must also be $\emptyset$.

Thus $A = B - A \implies A = B = \emptyset$



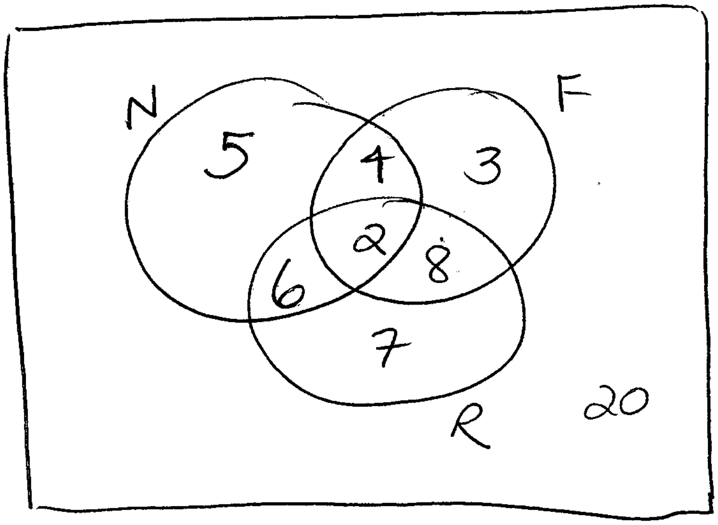


2.4 20   Let N = set of people who've seen the Natural
F =   "   Field of Dreams
R =   "   The Rookie

given: $n(\underset{5}{N}) = 17$, $n(\underset{6}{F}) = 17$, $n(R) \underset{7}{=} 23$

$n(\underset{2}{N \cap F}) = 6$, $n(\underset{3}{N \cap R}) = 8$ $n(\underset{4}{F \cap R}) = 10$

$n(\underset{1}{N \cap F \cap R}) = 2$ + $\underset{8}{N(U)} = 55$



neer numbers to add up to 55

a) how many have seen exactly 2?
$4+6+8 = 18$

b) exactly one?
$5+3+7=15$

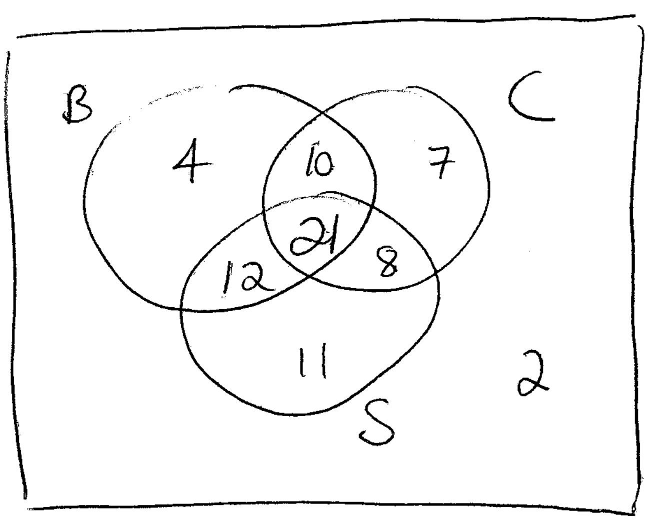
c) none - 20

d) the Natural but neither of the others? 5

26. B = set of patients with high blood pressure
C = set of " high cholesterol
S = " who smoke cigarettes

data
5 $n(B)=47$ 2 $n(B \cap S)=33$ 8 $n(U)=75$
6 $n(C)=46$ 3 $n(B \cap C)=31$
7 $n(S)=52$ 1 $n(B \cap C \cap S)=21$

4 $n[(B \cap C) \cup (B \cap S) \cup (C \cap S)] = 51$ $= 10+21+12+\underline{8}$



a) had either h.b.p or h.c but not both
$4+12+7+8 = 31$

b) fewer than 2 indications
$4+7+11+2 = 24$

c) were smokers but had neither hbp nor h.c
11

d) did not have exactly 2
$4+7+21+11+2 = 45$

34. The set of odd integers = A

$\mathbb{N} = \{1, 2, 3, \ldots\}$

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

correspondence?

$\mathbb{N}$	A
$1 \leftrightarrow 1$	
$2 \leftrightarrow 3$	
$3 \leftrightarrow 5$	
$\vdots$	
$n \leftrightarrow 2n-1$	

matching $n \leftrightarrow 2n-1$

thus $n(A) = \aleph_0$

44. $\{4, 7, 10, 13, 16 \ldots\} = A$

proper subset $B = \{7, 10, 13, \ldots\}$
(every element from B is in A and A contains something not in B)

A	B
4	7
7	10
10	13

$n \leftrightarrow n+3$

A is infinite because it can be placed in one-to-one correspondence with itself.