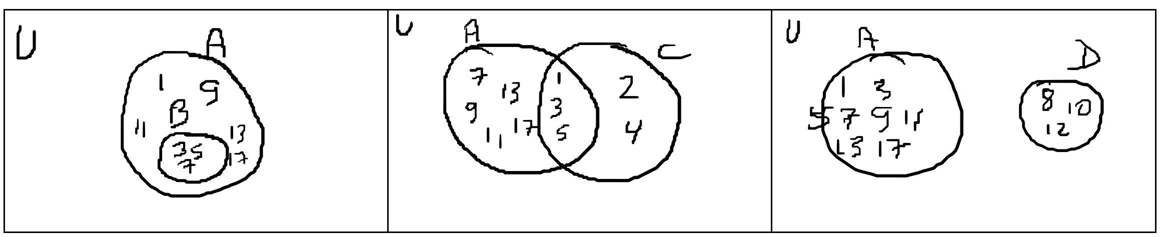
Answers to booklet 6

page 1: Ex1 A 13 B 0; C 13; D {1,2,3,4,6,8,12,16,24,32,48,96} i.e. there are 12 factors of 96
E $\aleph_0$ or infinite; F 5 G not well defined H 13; I 5; J $\aleph_0$ or infinite

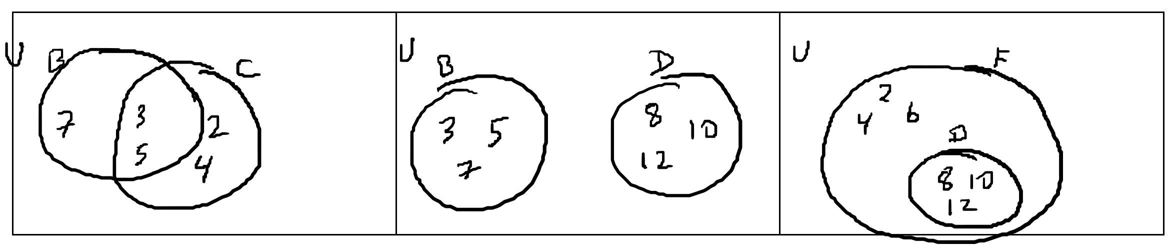
2. There are no equal sets in the list provided.
3. The following are equivalent: A, C and H have same cardinality 13; F and I both have 5 elements, and E and J are both infinite – which may or may not be equivalent ☺
4. all are finite except E and J

page 2-3: 1a. {1,2,3,4,5,6} 6 b. {HH, HT, TH, TT } 4 c. X = neither red nor blue, R= Red, B = Blue. {RB, BR, BX, XB, XX} there are 5 possibilities d. {MM, MF, FM, FF} 4
e. {G1, G2, G3, R4, R5, R6, B7} 7 f. {HHH, HHT, HTH, THH, HTT, THT, TTH, TTT} 8
g. {(1,1) (1,2) (1,3) (1,4) (1,5) (1,6) (2,1) (2,2) (2,3) (2,4) (2,5) (2,6) (3,1) (3,2) (3,3) (3,4) (3,5) (3,6) (4,1) (4,2) (4,3) (4,4) (4,5) (4,6) (5,1) (5,2) (5,3) (5,4) (5,5) (5,6) (6,1) (6,2) (6,3) (6,4) (6,5) (6,6) } there are 36 distinct possibilities
h. {2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, } there are 12 elements in the set

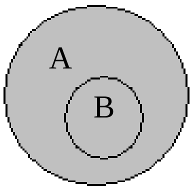
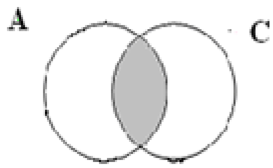
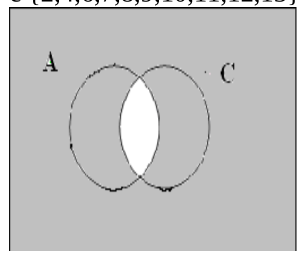
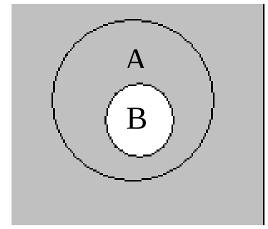
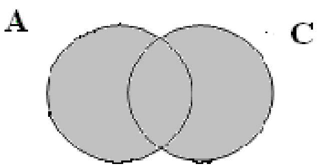
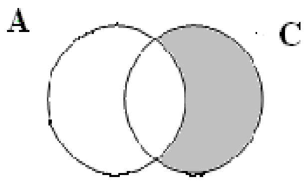
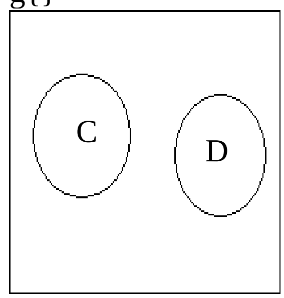
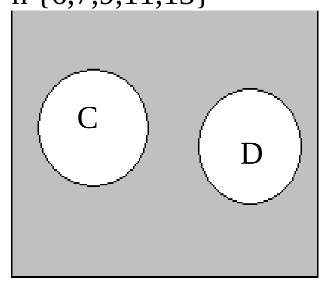
page 4: 1a B $\subseteq$ A; b. A & C overlap; c. A & D are disjoint



d. B & C are overlapping; e. B&D are disjoint; f. D $\subseteq$ F

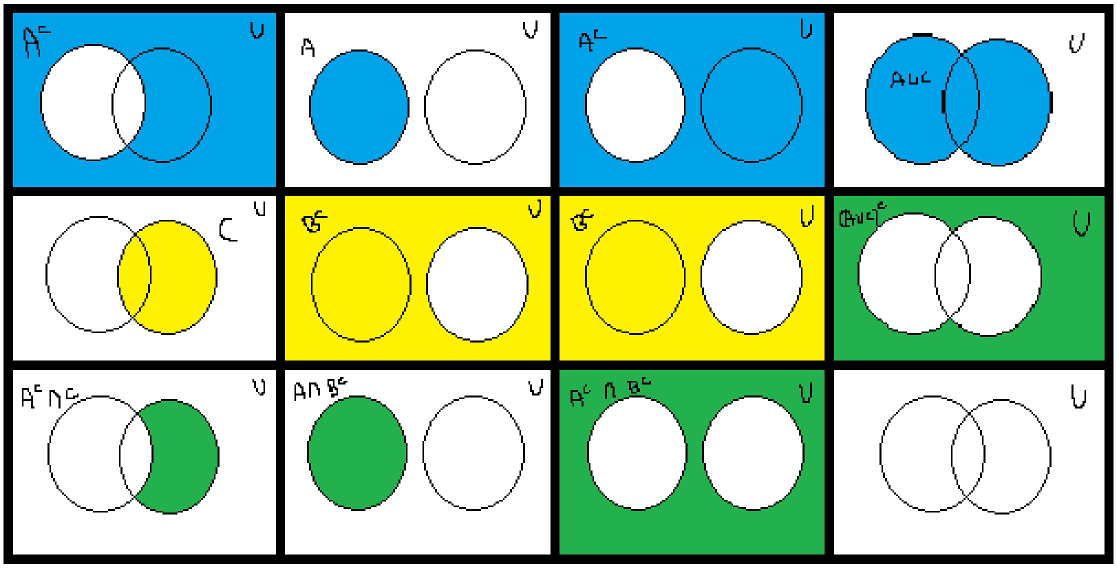


page 7: Exercise 1.

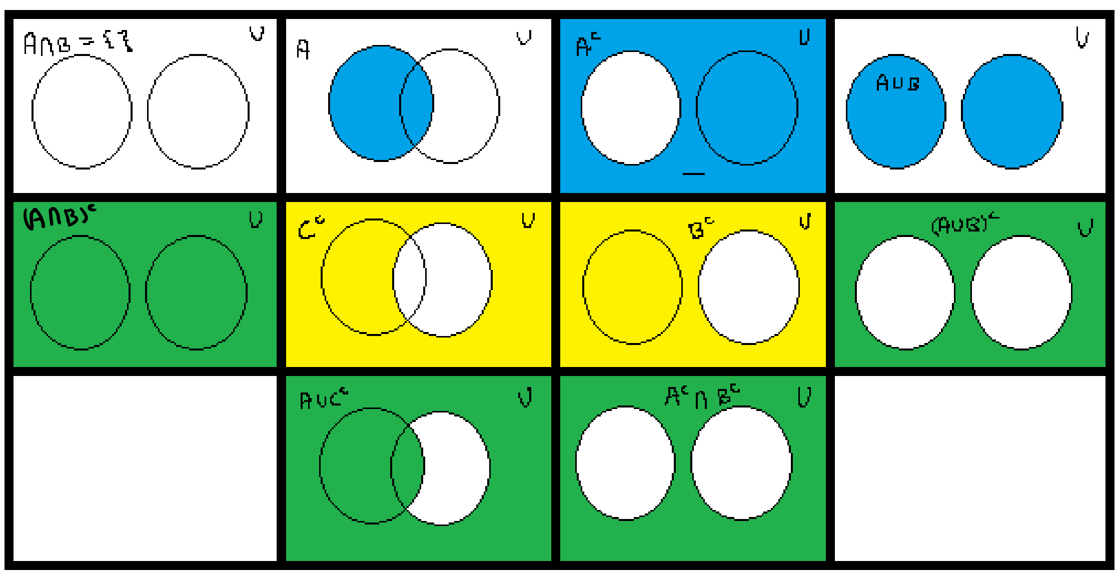
a A ∪ B = {1,3,5,7,9,11,13} 	b. A∩C = {1,3,5} 	c {2,4,6,7,8,9,10,11,12,13} 	d {1,2,4,6,8,9,10,11,12,13} 
e {1,2,3,4,5,7,9,11,13} 	f {2,4} 	g{} 	h {6,7,9,11,13} 

Page 8 exercise 2

a) $A^C \cap C$ b) $A \cap B^C$ c) $A^C \cap B^C$ d) $(A \cup C)^C$



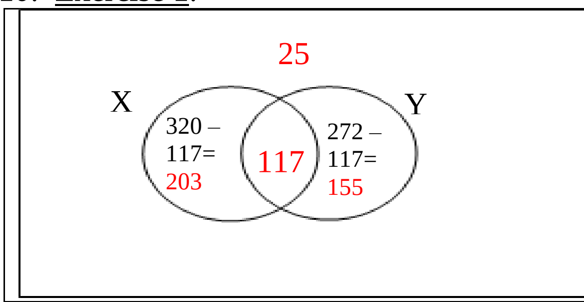
e) $(A \cap B)^C$ f) $A \cup C^C$ g) $A^C \cap B^C$ h) $(A \cup B)^C$



page 9: 1. a {} {2} {4} {6}   {2,4} {2,6} {4,6} {2,4,6} b There are 8 subsets of Q

2. A {} {3} {6} {9} {12} {3,6} {3,9} {6,9} {3,12} {6,12} {9,12} {3,6,9} {3,6,12}, {3,9,12}, {6,9,12} {3,6,9,12} b There are 16 subsets of T
3. A set it 3 elements has 8 subsets
   A set with 4 elements has 16 subsets…. Which is 8*2…   if you look at a set of 2 elements you will see it has 4 subsets.   Look for the pattern!
   If a set has q elements then it will have 2^q subsets.
   A set with 5 elements will have 2^5=32 subsets.

Page 10: Exercise 1:

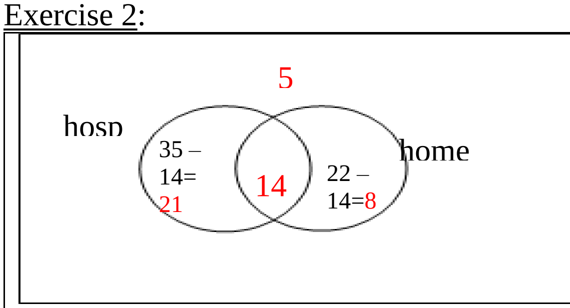


a) How many residents have both condition X and condition Y? 117
b) How many residents have neither condition X, nor condition Y? 500 – 203-117-155 = 25
c) How many only have condition X? 203
d) How many only have condition Y? 155

As contingency table:

x	yes (y)	no	Total
yes	117	203	320
no	155	25	180
Total	272	228	500

Exercise 2:



a) How many residents eat both hospital and home cooked food? 14
b) How many residents eat neither hospital nor home cooked food? 5
c) How eat only hospital food? 21
d) How many only eat home cooked food? 8