2.1 The Language of Sets

(1) $A = \{0,1,2,3,4,5,6,7,8,9\}$
$A = \{x : x \text{ is a digit}\}$

(2) $B = \{x : x \text{ is a funny movie}\}$
This is not well defined since it is unclear as to what "funny" means.

(4) $A = \{\text{football, baseball, hat, foot, shoe}\}$
$n(A) = 5$

(10) $S = \{-4,-3,-2,-1,0,1,2,3,4\}$

(12) $L = \{7,9,11,13,15,17,19\}$

(17) $P = \emptyset$

(45) $5 \in \{y : y \text{ is a rational number}\}$

(47) $0 \notin \emptyset$

(51) $n(A) = 6$

(56) $n(A) = 5$

(65) $4.6 \in A$ but $4.6 \notin B$

(68) snake $\in A$ but snake $\notin B$

(73) $H = \{x : x \text{ is a Humanities class}\}$

(76) $C = \{\text{History012, English010, English220, Psychology200}\}$

2.2 Comparing Sets

(15) Every elt in set A is also in set B. True.

(17) False. To be a proper subset of B, B must contain at least one elt not in A.

(28) $n(T) = 8$ $\therefore$ these sets are not equivalent
$n(R) = 6$

(31) $n(A) = 8$ $\therefore$ these sets are equivalent
$n(B) = 8$

(36) $\{1,2\}$ $\{2,3\}$ $\{3,4\}$
$\{1,3\}$ $\{2,4\}$
$\{1,4\}$

(45) $2^7 = 128$

(47) $2^8 = 256$

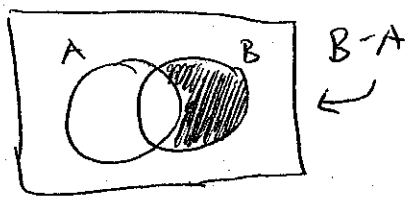
2.3 Set Operations

① $A \cup B = \{x : x \in A \text{ or } x \in B \text{ (or both)}\}$

② $A \cap B = \{x : x \in A \text{ and } x \in B\}$

③ A' is the set consisting of all the x's that exist in the universal set, but not in A.

④



⑨ $A \cap B = \{1, 3, 5\}$

⑩ $A \cup B = \{1, 2, 3, 4, 5, 6, 7, 9\}$

⑪ $B \cup C = \{1, 2, 3, 4, 5, 6, 7, 8\}$

⑫ $B \cap C = \{2, 4, 6\}$

⑬ $A \cup \emptyset = A$

⑭ $A \cap \emptyset = \emptyset$

⑮ $A \cup U = U$

⑯ $A \cap U = A$

⑰ $A \cap (B \cup C) = \{1, 3, 5, 7\}$

⑱ $A' = \{2, 4, 6, 8, 10\}$

$C' = \{1, 3, 5, 9, 10\}$

$B \cup C' = \{1, 2, 3, 4, 5, 6, 9, 10\}$

$\therefore A' \cap (B \cup C') = \{2, 4, 6, 10\}$

(35) $B-A$

(36) $(A-B) \cup (B-A)$

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

(38) $((A-B) \cup (B-A))'$

(39) $A \cap B \cap C$

(40) $(A \cap B) \cup (A \cap C)$

(41) $(A \cup C) - B$

(42) $(A \cup B \cup C) - (A \cap B \cap C)$

(43) $n(A) = 6+4+11+9 = 30$

(44) $n(A \cup B) = 6+4+11+9+7+13 = 50$

(45) $n(C') = 5+6+4+13 = 28$

(46) $n(A-C) = 6+4 = 10$

(47) $n(A \cap C) = 9+11 = 20$

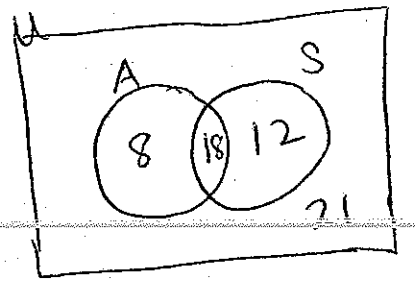
(48) $n(A \cap B \cap C) = 11$

(49) $n((A \cup B) \cap C) = 9+11+7 = 27$

(50) $n((A \cup C) - (B \cup C)) = 6$

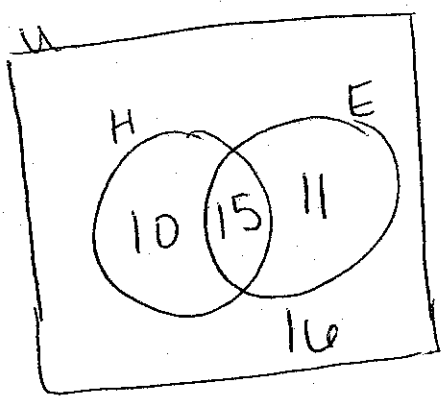
2.4 Survey Problems

(33)



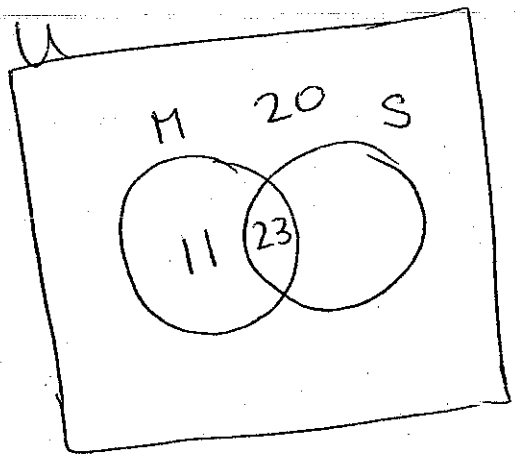
59

(34)



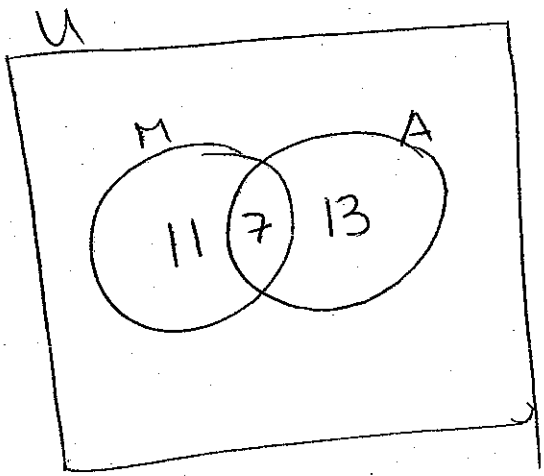
26

(35)



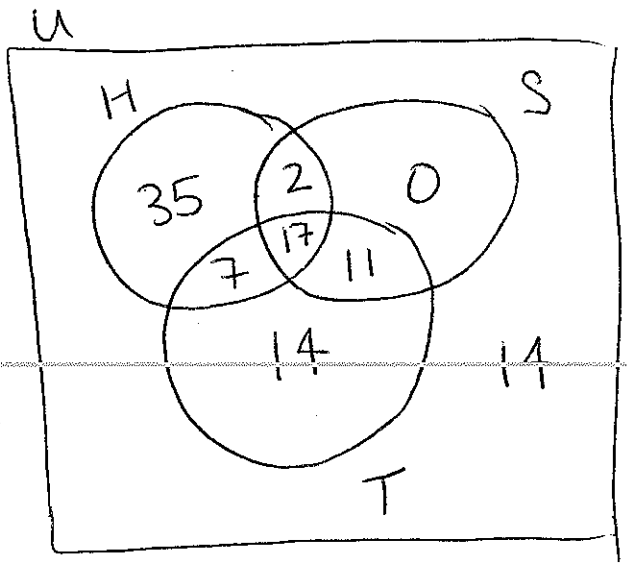
$82-(20+23+11)=28$

(36)



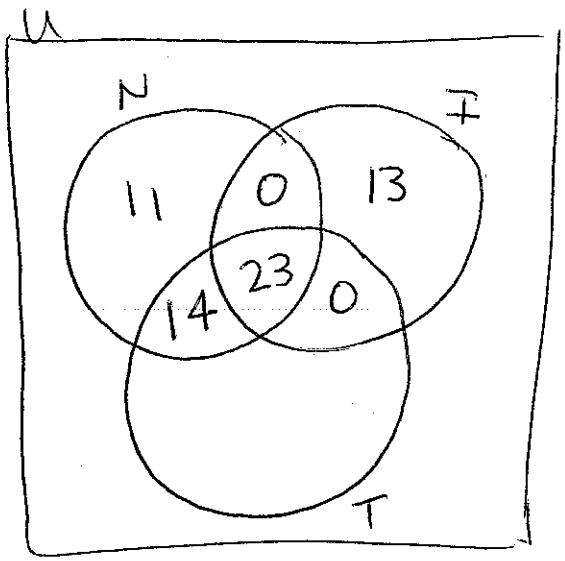
$95-(11+7+13)=64$

(37)



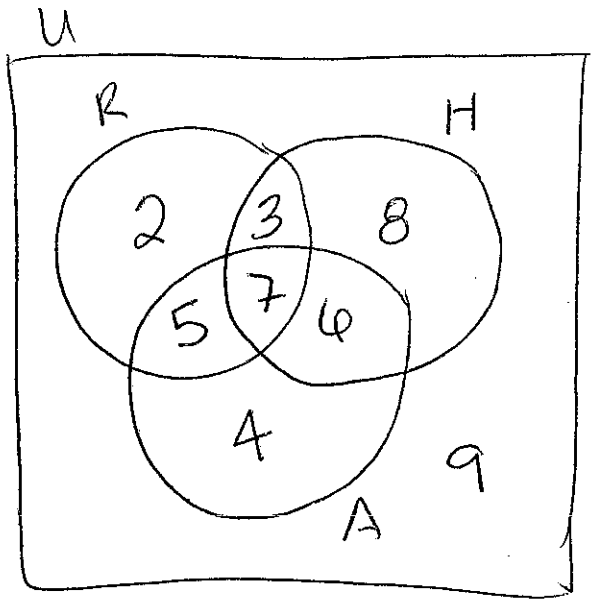
30 attended the BBQ.
49 purchased tour guide

(39)



23

(41)



a) 44
b) 27
c) 8