- Using a Venn diagram, show that:
  - a)  $(A \cup B)' = A' \cap B'$

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

- In a group of 35 people:
  - 7 people are left-handed.
  - 15 people wear glasses.
  - 17 people have brown hair.
  - 3 people with brown hair wear glasses and are left-handed.
  - 25 people have brown hair or wear glasses.
  - 7 people have brown hair and wear glasses.
  - 20 people are left-handed or have brown hair.
  - 5 people wear glasses and are left-handed.

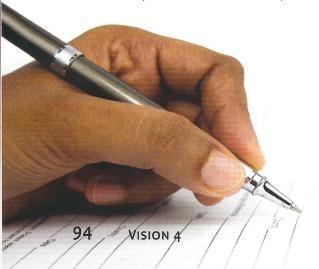
A person is chosen at random from this group. The following are 3 possible events:

A: choosing a left-handed person

B: choosing a person who wears glasses

C: choosing a person with brown hair

- a) Represent this situation using a Venn diagram.
- b) Express each of the following statements using set-builder notation.
  - 1) Choosing a person who wears glasses and is left-handed.
  - 2) Choosing a left-handed person who wears glasses or has brown hair.
  - 3) Choosing a person who has brown hair and wears glasses or a left-handed person who has brown hair.
- c) Calculate:
  - 1)  $P(A \cup B)$
- 2)  $P(A \cap B)$  3)  $P(A \cup B \cup C)$
- 4)  $P((A \cap B) \cap C)$  5)  $P((A \cup B) \cap C)$  6)  $P((B \cap C) \cup A)$
- d) Calculate the probability of choosing a person:
  - 1) who wears glasses and does not have brown hair
  - 2) who does not wear glasses and is not left-handed
  - 3) who is left-handed, does not wear glasses and does not have brown hair



It is estimated that between 10% and 12% of the population is left-handed. Having a left-handed parent increases the probability that a child will also be left-handed.