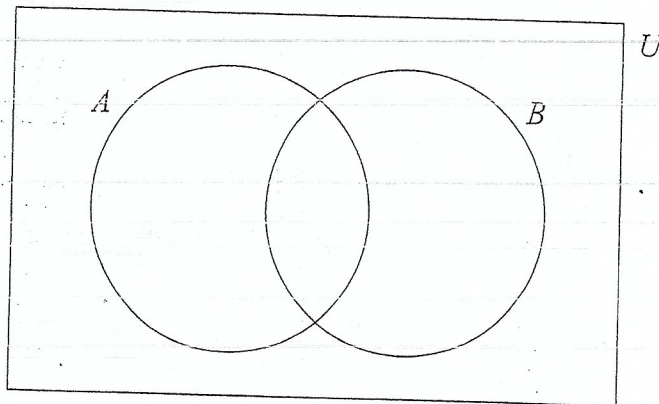


IB Sets + Venn

Aleph has an unbiased cubical (six faced) die on which are written the numbers 1, 2, 3, 4, 5 and 6.

Beth has an unbiased tetrahedral (four faced) die on which are written the numbers 2, 3, 5 and 7.

- (a) Complete the Venn diagram with the numbers written on Aleph's die (A) and Beth's die (B).



[2]

- (b) Find $n(B \cap A')$.

[2]

A group of students at Dune Canyon High School were surveyed. They were asked which of the following products: books (B), music (M) or films (F), they downloaded from the internet.

The following results were obtained:

- 100 students downloaded music;
- 95 students downloaded films;
- 68 students downloaded films and music;
- 52 students downloaded books and music;
- 50 students downloaded films and books;
- 40 students downloaded all three products;
- 8 students downloaded books **only**;
- 25 students downloaded none of the three products.

- (a) Use the above information to complete a Venn diagram. [5]
- (b) Calculate the number of students who were surveyed. [2]
- (c) (i) On your Venn diagram, shade the set $(F \cup M) \cap B'$. Do not shade any labels or values on the diagram.
- (ii) Find $n((F \cup M) \cap B')$. [3]

[Maximum mark: 17]

50 students at Rambling High School were asked how they travelled to school yesterday. All of the students travelled by bus, by car or walked.

- 12 students travelled by car only
- 7 students travelled by bus only
- 5 students travelled by car and walked, but did not use a bus
- 10 students travelled by bus and walked, but did not use a car
- 3 students used all three forms of travel.

(a) Represent this information on a Venn Diagram.

[4 marks]

There were 28 students who used a bus to travel to school.

(b) Calculate the number of students

- (i) who travelled by car and by bus but did not walk;
- (ii) who travelled by car.

[4 marks]

[Maximum mark: 14]

A group of tourists went on safari to a game reserve. The game warden wanted to know how many of the tourists saw Leopard (L), Cheetah (C) or Rhino (R). The results are given as follows.

- 5 of the tourists saw all three
- 7 saw Leopard and Rhino
- 1 saw Cheetah and Leopard **but not** Rhino
- 4 saw Leopard **only**
- 3 saw Cheetah **only**
- 9 saw Rhino **only**

(a) Draw a Venn diagram to show this information.

[4 marks]

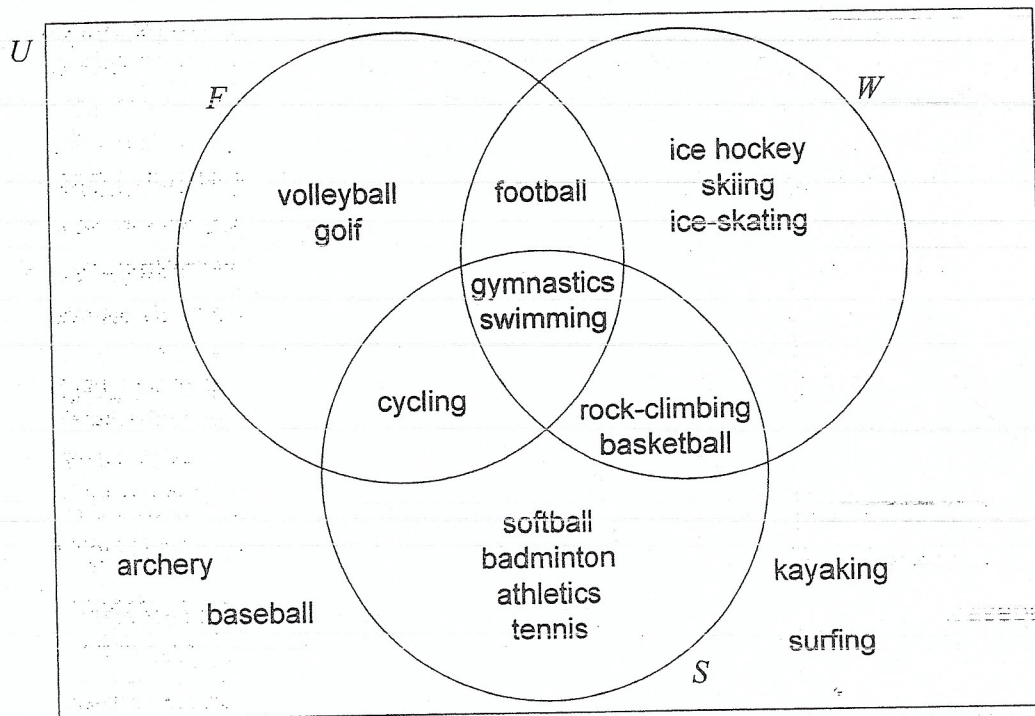
There were 25 tourists in the group and every tourist saw at least one of the three types of animal.

(b) Find the number of tourists that saw Cheetah and Rhino **but not** Leopard.

[2]

Dune Canyon High School organizes its school year into three trimesters: fall/autumn (F), winter (W) and spring (S). The school offers a variety of sporting activities during and outside the school year.

The activities offered by the school are summarized in the following Venn diagram.



- (a) Write down the number of sporting activities offered by the school during its school year. [1]
- (b) Determine whether rock-climbing is offered by the school in the fall/autumn trimester. [1]
- (c) Write down
- the elements of the set $F \cap W'$; [2]
 - $n(W \cap S)$. [2]
- (d) Write down, in terms of F , W and S , an expression for the set which contains only archery, baseball, kayaking and surfing. [2]