5.1   Venn Diagram Problem Solving
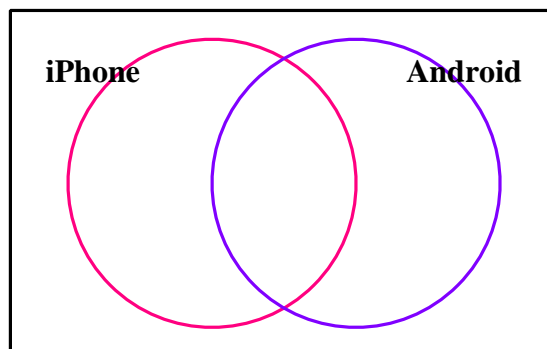

A group of 75 students were asked if they'd like to own an iPhone™
They were also asked if they'd like to own an Android™ phone

◇ 40 said they'd like to own an iPhone™

◇ 50 said they'd like to own an Android™ phone

◇ 35 said they'd like to own both an iPhone™ and an Android™ phone

How many students didn't wish to own either phone ?

[5 marks]

Teaching Video : http://www.NumberWonder.co.uk/v9003/4.mp4
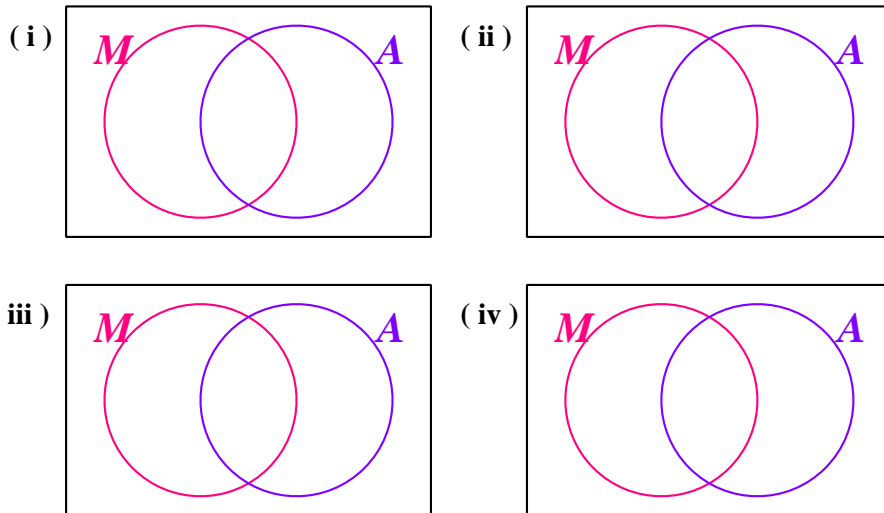
5.2 Exercise

Marks Available : 56

Question 1

At a school there is a maths club, the **MathMagicians**, *M*.

There is also an art club, the **Artisans**, *A*.

On a Venn Diagrams below, shade the part that represents;

      (i)   The pupils who belong to the Maths club.

      (ii)   The pupils who belong to both clubs.

      (iii)   The pupils who belong to only one of the two clubs.

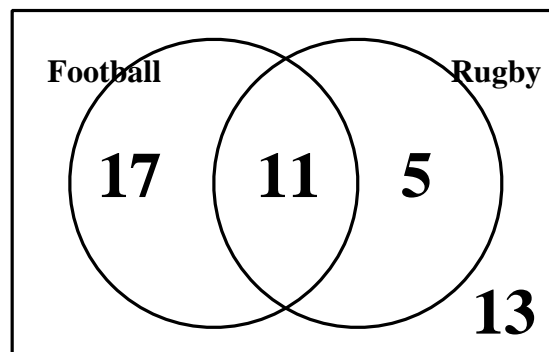   **(iv)**   The pupils who do not belong to either club.

[4 marks]

Question 2

A group of students were asked if they played football.

They were also asked if they played rugby.

The Venn Diagram provides a summary of their replies.

(i)   How many students play football only ?

             [1 mark]

(ii)   How many students play football ?

             [1 mark]

(iii)   How many students don't play rugby ?

             [1 mark]

(iv)   How many students play exactly one of the two sports ?
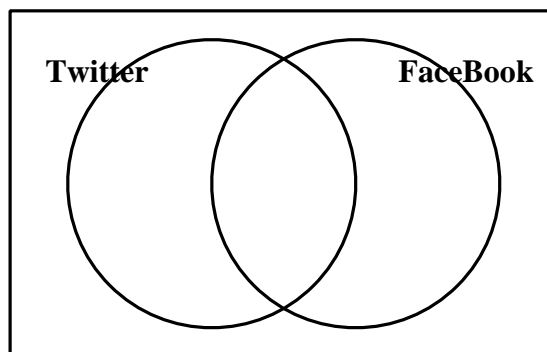
             [1 mark]

Question 3

A group of 100 students were asked if they used Twitter™ regularly.
They were also asked if they used FaceBook™ regularly.
Here is a summary of their answers:

◇ 36 said they used Twitter™ regularly.

◇ 44 said they used FaceBook™ regularly.

◇ 20 said they used both and Twitter™ and FaceBook™ regularly.

(i) Complete the Venn Diagram to help clarify the students' replies :

[4 marks]

(ii) How many students use only Twitter™ regularly ?

[1 mark]

(iii) How many students use neither Twitter™ nor FaceBook™ ?

[1 mark]

(iv) How many students do not use FaceBook™ regularly ?
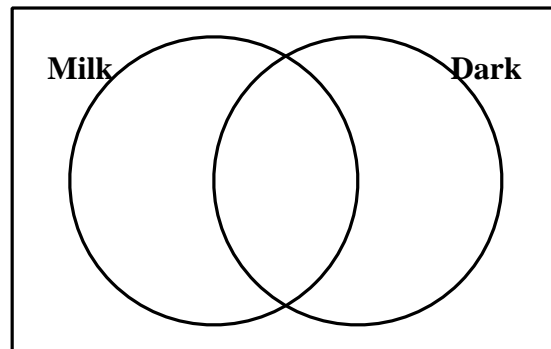
[1 mark]

Question 4

A class of 24 pupils were asked if they liked *milk* chocolate.
They were also asked if they liked *dark* chocolate.
Here is a summary of their answers:

◇ 9 said they liked *milk* chocolate only

◇ 10 said they didn't like *milk* chocolate

◇ 3 said they did not like chocolate

(**i**) Complete the Venn Diagram to help clarify the pupils' replies.

[4 marks]

(**ii**) How many pupils like both *milk* and *dark* chocolate ?

[1 mark]

(**iii**) How many pupils like *dark* chocolate ?

[1 mark]

(**iv**) How many pupils don't like *dark* chocolate ?

[1 mark]

(**v**) In a similar group of 96 pupils, estimate how many would not like *milk* chocolate.
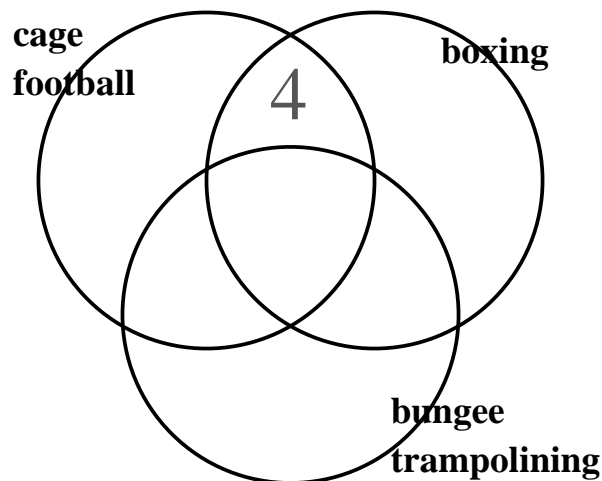
[1 mark]

Question 5

A sports club has 80 members.
They all play at least one of cage football, boxing, or bungee trampolining.
In talking to a newspaper about the sports club the manager states that:

◇ 16 members do all three activities.

◇ 20 members do cage football and boxing.

◇ 40 members do boxing and bungee trampolining.

◇ 24 members do bungee trampolining and cage football.

◇ 60 members do bungee trampolining.

◇ 46 members do boxing.

(**i**) Complete the Venn Diagram to help clarify the manager's statements.
(The 4 is in there so you can check you're getting it right)

[6 marks]

(**ii**) How many members play only cage football ?

[1 mark]

(**iii**) How many members play cage football ?

[1 mark]

(**iv**) How many members play exactly one of the three activities ?

[1 mark]

(**v**) How many members play exactly two of the three activities ?

[1 mark]

Question 6

In a class of 24 pupils there are 8 who are left handed.
There are 15 boys in the class
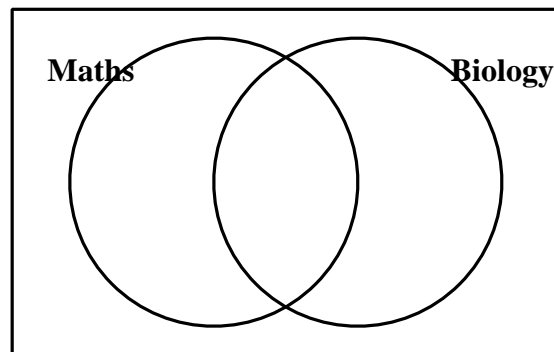If 5 boys are left handed, how many girls are not left handed ?

[4 marks]

Question 7

A school has 200 students in its 6th form.

The director of studies reports that;

◇ 100 study maths.

◇ 58 study biology.

◇ 68 study neither maths nor biology.

◇ 142 don't study biology.

(**i**)   Complete the Venn Diagram to clarify the director of studies' report.

[**4 marks**]

(**ii**)   How many students study maths and biology ?
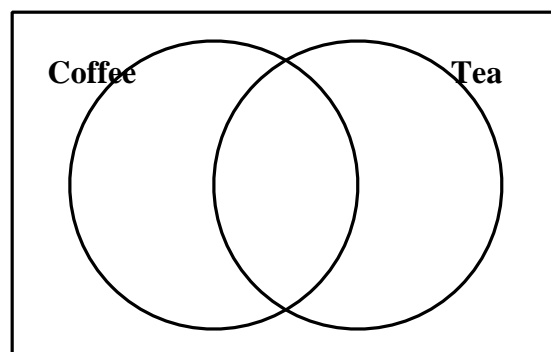
[**1 mark**]

Question 8

In a survey, 100 members of the public are asked if they like coffee.
They are also asked if they like tea.

◇ 45 said they did not like coffee.

◇ 35 said they did not like tea.

◇ 28 said they liked neither coffee nor tea.

(**i**)   Complete the Venn diagram to clarify the survey's findings.

[**4 marks**]

(**ii**)   How many liked both coffee and tea ?

[**1 mark**]

Question 9

Sherlock Holmes is investigating a theft from a bank safe.
He knows that one of the bank's 40 workers is the thief.
(It was clearly an 'inside job')

At the crime scene, on top of the safe, he finds a pair of glasses.
These, deduces Holmes, were used by the thief to read the numbers on the
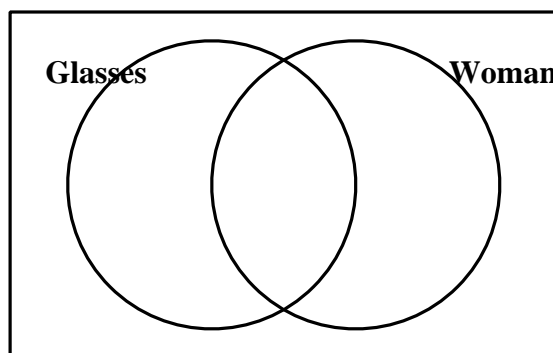combination lock of the safe, then placed on top, and left in error.

He also finds a used lipstick, which Holmes realises fell out of a woman's
handbag when the money from the safe was stuffed into it.

Reasoning that men who work in a bank do not use lipstick or carry handbags,
Holmes eliminates the 8 men with perfect eyesight from his list of suspects.

At the bank, 11 workers wear glasses and 23 are women.

Sherlock asks you, his trusty assistant, to draw a Venn Diagram in order to
clarify the facts.

Do so, here :

[4 marks]

How many of the bank workers are women who wear glasses, and are thus
suspected of committing the crime ?

[1 mark]

Question 10

Clare and Lucy are twin sisters.
They have 20 lipsticks in their collection.
Clare likes 16 of the lipsticks, and Lucy likes 12.

Complete this sentence:

Clare and Lucy both like between _____ and _____ lipsticks.

[4 marks]

The answer to this question is not a single number.