

Name:.....

Total Marks:.....

GCSE (9-1) Grade 5 Venn Diagrams



Instructions

Use **black** ink or ball-point pen.

Fill in the boxes at the top of this page with your name.

Answer **all** questions.

Answer the questions in the spaces provided

– there may be more space than you need.

Show all your working out

Information

The total mark for this paper is 59.

The marks for **each** question are shown in brackets.

Use this as a guide as to how much time to spend on each question.

Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed

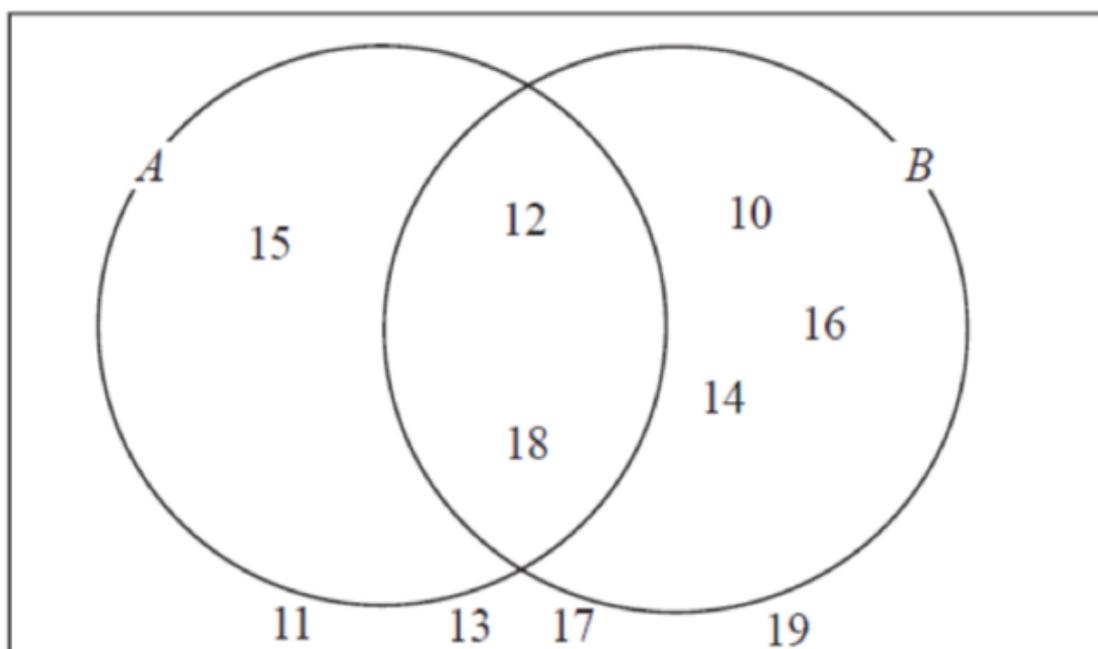
Advice

Read each question carefully before you start to answer it

Attempt every question

Check your answers if you have time at the end

1. Here is a Venn Diagram



Write down the numbers that are in set

(a) $A \cup B$ (1)

(b) $A \cap B$ (1)

(c) $A' \cap B'$ (1)

(d) $A' \cup B$ (1)

(e) $A \cap B'$ (1)



2. Sandeep gathered some information about the pet dogs and pet cats in his road.

There are 100 families in this road.

68 families have a dog, 42 have a cat and 15 have a dog and a cat.

No family had more than 1 cat or more than 1 dog.

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

.....
(3 marks)

(b) Find the probability of a family, chosen at random, having neither dog nor a cat.

.....
(2 marks)



3. A garage has 50 cars for sale.

15 of the cars have air conditioning and ABS brakes

31 of the cars have air conditioning

17 of the cars have ABS brakes

Work out the probability of the cars that do **not** have air conditioning or ABS brakes.

.....
(Total 4 marks)



4. A running club has 120 members.

88 of the members take part in road races

55 of the members take part in marathons

17 of the members do not run in road races or in marathons

Work out the probability that a member only takes part in a road race or in a marathon but not both.

.....
(Total 4 marks)



5. Anjali asked 60 students in her year group about where they had eaten out in the last month. Here are her results:

26 had eaten in Subfood

11 had eaten in Macdinner and Subfood

12 had not eaten at Macdinner or Subfood

- (a) Draw a Venn diagram to represent this information.

.....
(3 marks)

- (b) Find the probability of a student who had eaten at Macdinner.

.....
(2 marks)



6. 90 people in a sports club were surveyed.

19 play tennis and squash

50 play tennis

32 play squash

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

.....
(3 marks)

One person is chosen at random.

(b) Work out the probability that

(i) the person chosen does not play tennis

.....
(2 marks)

(ii) the person chosen plays tennis or squash or both.

.....
(2 marks)



7. All the members of a group of 35 students belong to at least one club.

There are 3 clubs: chess, drama and art.

8 of the students belong to only the art club

6 of the students belong to all 3 clubs

3 of the students belong to the chess and art clubs but not to the drama club

18 of the students belong to the art club

3 of the students belong only to the chess club

4 of the students belong only to the drama club

(a) Work out the probability that a student belongs to the chess club and to the drama club but not to the art club?

.....
(4 marks)

(b) Work out the probability that a student belongs to the chess club.

.....
(2 marks)



8. In a group of 100 students
- 42 study Statistics
 - 40 study Mathematics
 - 50 study Physics
 - 21 study Mathematics and Physics
 - 19 study Statistics and Physics
 - 17 study Statistics and Mathematics
 - 5 study all three
- (a) Draw a Venn diagram to represent this information.

.....
(3 marks)

One of the students is picked at random.

- (b) Find the probability that this student studies only **one** of these subjects.

.....
(2 marks)

9. 140 people were asked in a tasting survey to say which, if any, of three cakes they liked.

Here are the results.

- 86 people liked cake *A*
- 93 people liked cake *B*
- 76 people liked cake *C*
- 52 people liked cakes *A* and *B*
- 51 people liked cakes *B* and *C*
- 43 people liked cakes *A* and *C*
- 30 people liked all three cakes.

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

.....
(3 marks)

A person is chosen at random from those who took part in the survey.

- (b) Find the probability that this person
- (i) did not like any of the three cakes,

.....
(2 marks)

- (ii) liked cake *A* but not cake *B*.

.....
(2 marks)



10. A group of 200 adults were asked which types of magazines they read.
Their replies showed that

82 read Sports magazines

80 read Garden magazines

84 read Fashion magazines

36 read Sports magazines and read Garden magazines

31 read Sports magazines and read Fashion magazines

25 read Garden magazines and read Fashion magazines

14 read Sports magazines and read Garden magazines and read Fashion magazines

One of the adults asked is to be chosen at random.

Find the probability that this adult

(a) reads none of these types of magazine,

.....
(4 marks)

(b) reads exactly two of these types of magazine.

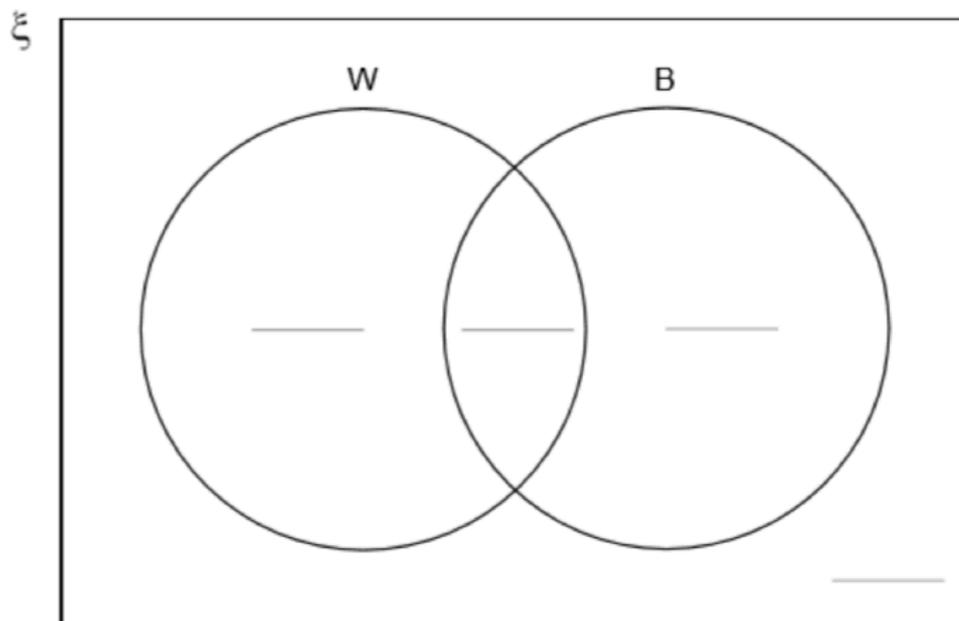
.....
(2 marks)

11. In the Venn diagram

$$\xi = 100 \text{ farms}$$

W = farms that grow wheat

B = farms that grow barley



70 farms grow only wheat or only barley

$\frac{4}{5}$ of these 70 farms grow only wheat

The number of farms that grow wheat is three times the number that grow barley

Complete the Venn diagram

.....
(Total 5 marks)

TOTAL FOR PAPER: 59 MARKS