

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Probability

Venn diagrams

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments
- You must not use a calculator



Information

- The marks for questions are shown in brackets

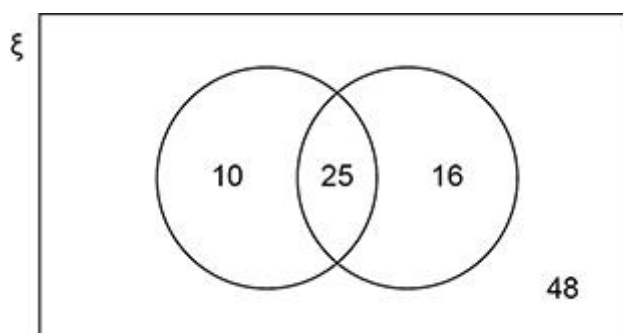
Advice

- In all calculations, show clearly how you work out your answer

Questions 1 to 6 are **foundation** tier only

Q1.

In a group of 98 students
25 study both Art and French
10 study Art but do not study French
41 study French.
Joel draws this Venn diagram to represent the information.
 ξ = the group of 98 students
A = the students who study Art
F = the students who study French

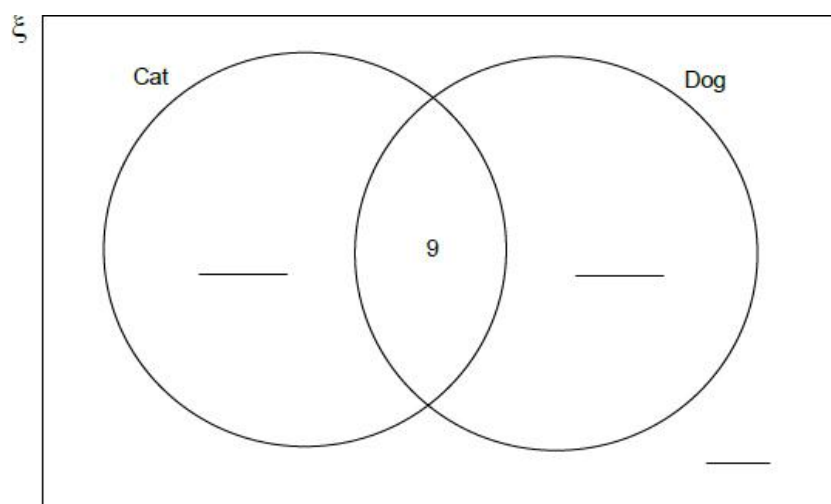


Make **two** criticisms of his diagram.

(Total 2 marks)

Q2.

30 pupils are asked about their pets.
The Venn diagram shows some information about their answers.



(a) What does the number 9 on the diagram represent?

(1)

(b) 16 pupils have a cat and 17 pupils have a dog.
Complete the Venn diagram.

(3)

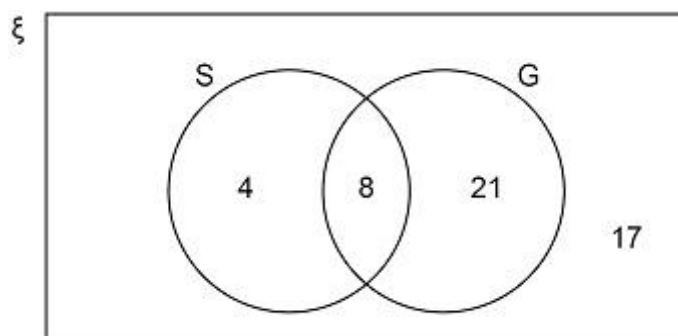
(Total 4 mark)

Q3.

The Venn diagram shows information about 50 people who are in bands.

S = singers

G = guitar players



(a) How many of the people are guitar players?

(1)

(b) How many of the people are singers but **not** guitar players?

(1)

(c) One of the people is chosen at random.
Write down the probability that the person is
not a singer
and
not a guitar player.

(1)

(Total 3 marks)

Q4.

Here are five shapes, A to E.

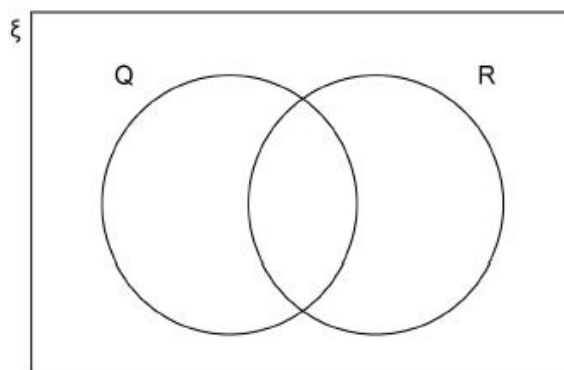
A	Parallelogram
B	Regular pentagon
C	Rhombus
D	Scalene triangle
E	Trapezium

In the Venn diagram,

ξ is the set of all shapes

Q is the set of quadrilaterals

R is the set of shapes which **always** have rotational symmetry.

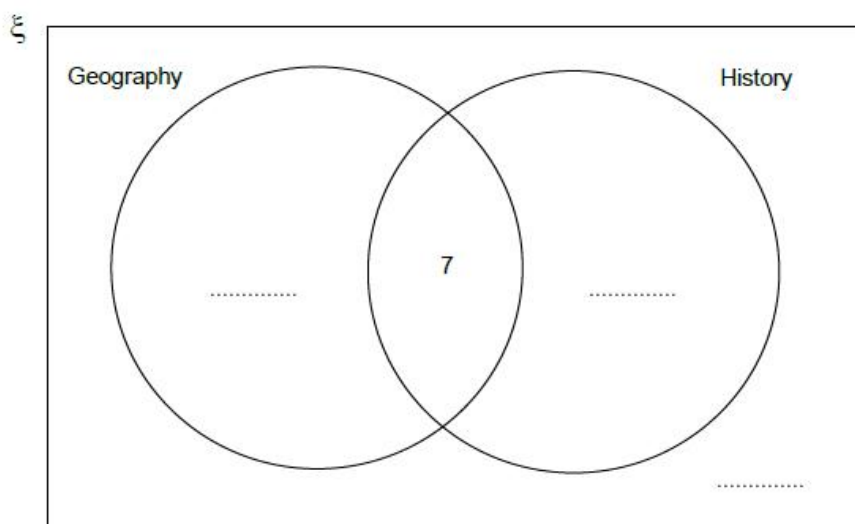


Complete the Venn diagram with the letters A to E.

(Total 3 marks)

Q5.

50 students are asked if they study Geography or History.
The Venn diagram shows some information about their answers.



(a) What does the number 7 on the diagram represent?

(1)

(b) 20 students study Geography but **not** History.
19 students study History.
Complete the Venn diagram.

(3)

(Total 4 marks)

Q6.

Here is some information about 120 people who visit a shop.

3

4 of the people buy neither a coat nor a dress.

19 people buy a coat.

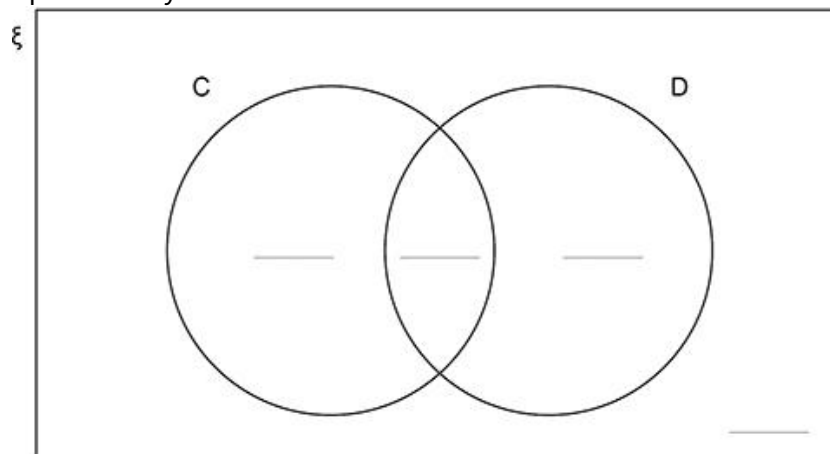
14 people buy a dress.

Complete this Venn diagram to represent the information.

ξ = 120 people who visit the shop

C = people who buy a coat

D = people who buy a dress



(Total 3 marks)

Questions 7 to 12 are **higher** tier only

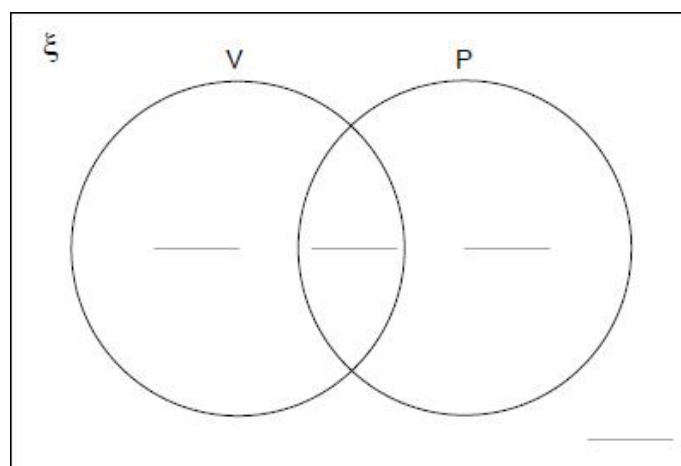
Q7.

In the Venn diagram

ξ = 75 students in a Year Group

V = students that play the violin

P = students that play the piano



54 students play **only** the violin or **only** the piano.

$\frac{5}{6}$ of these 54 students play **only** the violin.

The number of students that play the violin is four times the number that play the piano.

Complete the Venn diagram.

(Total 5 marks)

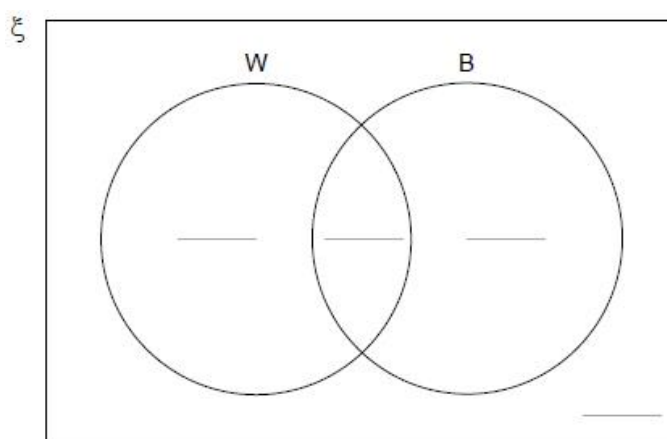
Q8.

In the Venn diagram

ξ = 100 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)

Q9.

Here is some information about 80 people who play in bands.

12 are singers but not guitar players.

30% are neither a singer nor a guitar player.

$\frac{1}{4}$

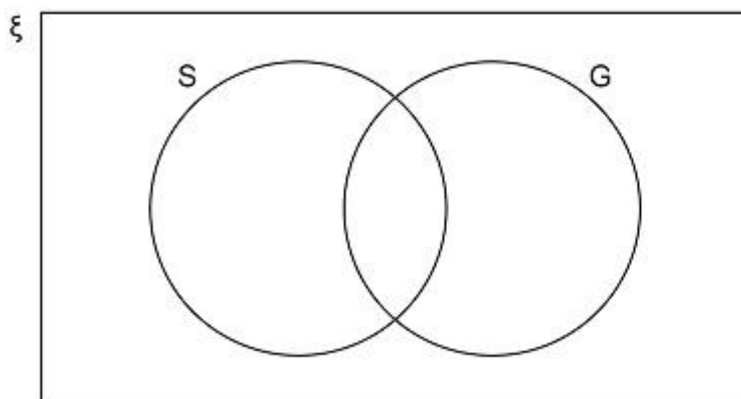
of the guitar players are also singers.

Complete this Venn diagram to represent the information.

ξ = 80 people who play in bands

S = singers

G = guitar players



(Total 4 marks)

Q10.

Clive owns two coffee shops, A and B.

Out of 150 people

- 18 people use both shops

- 46% use shop A

$\frac{2}{5}$

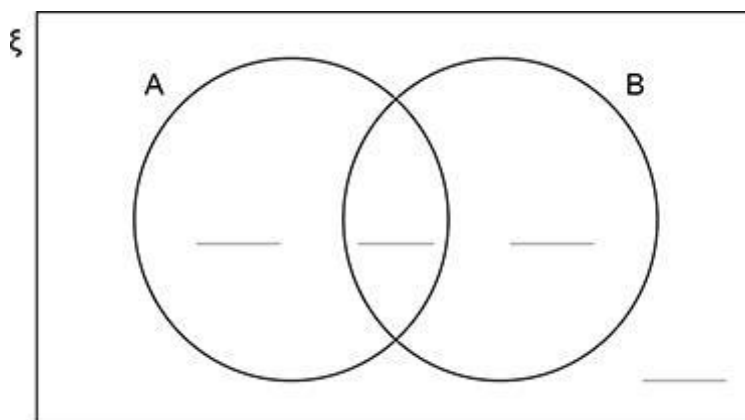
- use shop B **only**.

Complete the Venn diagram to represent the information.

ξ = 150 people

A = people who use shop A

B = people who use shop B



(Total 4 marks)

Q11.

At a country park there is a house, a museum and a garden.
The table shows the prices per person to visit the park.

	Price per person
Garden only	Free
House and museum	£12.50
House only	£8
Museum only	£7

One day, 480 people visit the park.

67 visit the garden **only**.

40% visit the house **and** the museum.

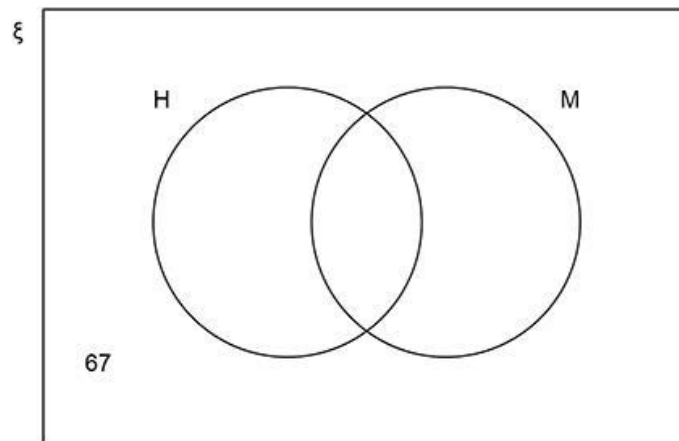
3

8 visit the house **only**.

The rest visit the museum **only**.

In total, how much do the 480 people pay to visit the park?

You may use the Venn diagram to help you.



(Total 5 marks)

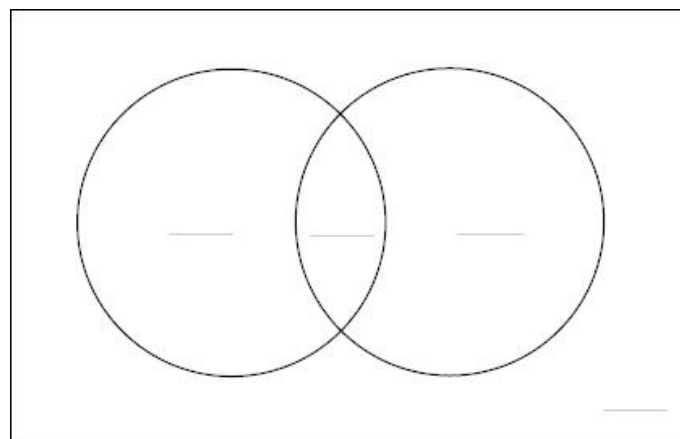
Q12.

100 children are asked if they can ride a bike or swim.

20 can do both, 30 can do neither.

Twice as many can ride a bike as can swim.

Complete the Venn diagram.



(Total 4 marks)