



S26-30min Venn Diagrams: 30-minute Pack

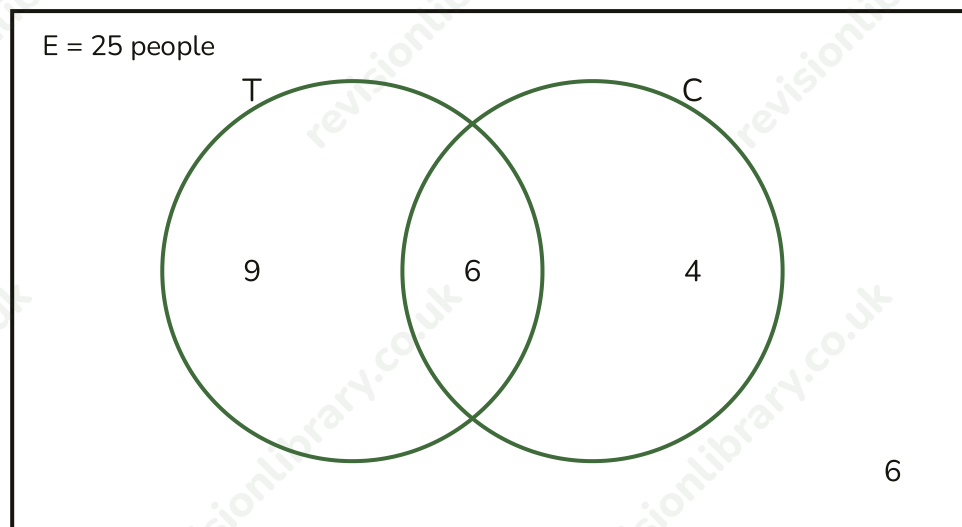
EDEXCEL 1ST0 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** 25 people were asked whether they drink tea (T) or coffee (C). The Venn diagram shows the results.



- (a) Write down the number of people who drink both tea and coffee. (1)

- (b) Work out the total number of people who drink tea (whether or not they also drink coffee). (2)

- (c) Write down the number of people who drink coffee but not tea. (1)

(Total for Question 1 is 4 marks)

2 For each statement about Venn diagrams, write down whether it is True or False.

(i) The rectangle in a Venn diagram represents the universal set, containing all the elements under consideration. **(1)**

.....

(ii) If two circles in a Venn diagram overlap, sets A and B must contain exactly the same elements. **(1)**

.....

(iii) The region outside both circles but inside the rectangle represents $n((A \cup B)')$, the elements in neither set. **(1)**

.....

(iv) For any two sets A and B, $n(A) + n(B)$ is always equal to $n(A \cup B)$. **(1)**

.....

(Total for Question 2 is 4 marks)

3 In a class of 28 students, 16 students study French (F), 11 students study Spanish (S), and 5 students study both French and Spanish.

(a) Work out the number of students who study French only (and not Spanish). (2)

.....

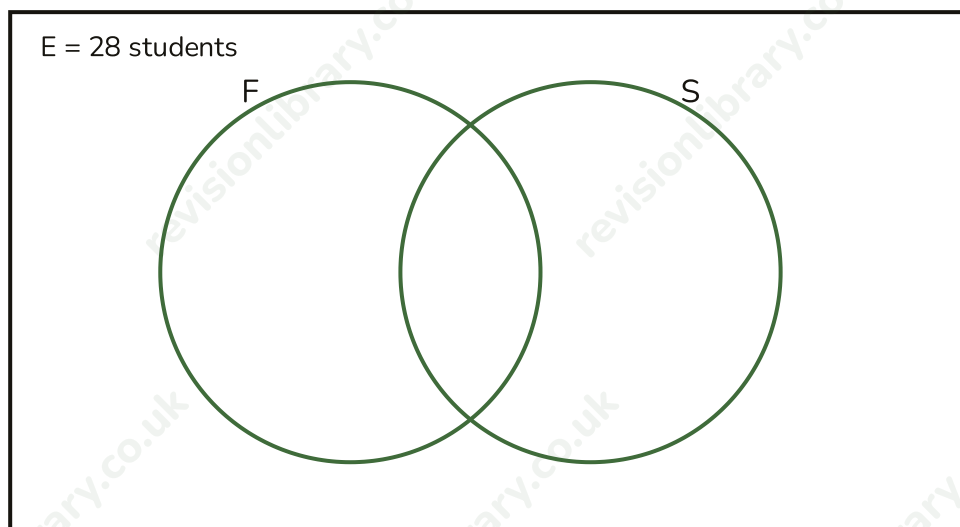
(b) Work out the number of students who study Spanish only (and not French). (2)

.....

(c) Work out the number of students who study neither French nor Spanish. (2)

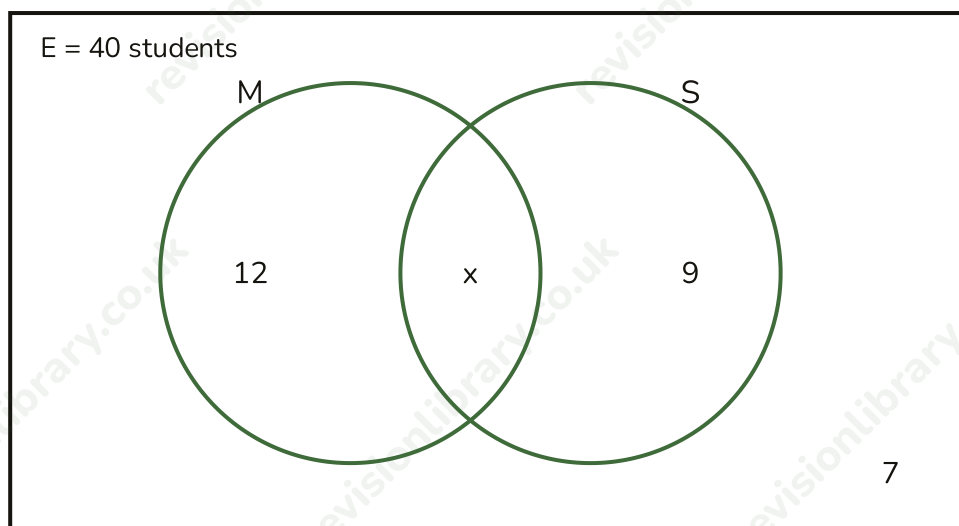
.....

(d) Draw a Venn diagram to show this information. Label each of the four regions with the correct number of students. (2)



(Total for Question 3 is 8 marks)

- 4 40 students were asked whether they like Maths (M) or Science (S). The Venn diagram shows the results, where x is unknown.



- (a) Form an equation in x for the total number of students, and solve it to find the value of x . (3)

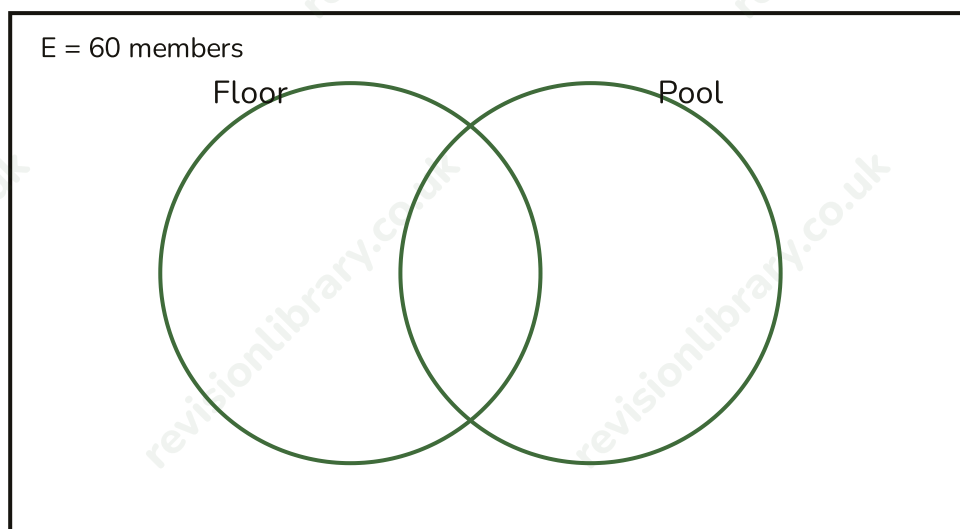
- (b) Hence work out the probability that a randomly selected student likes both Maths and Science. (2)

(Total for Question 4 is 5 marks)

- 5 A gym is planning its opening hours. As part of this, it surveys 60 of its members to find out whether they use the Pool and whether they use the Gym Floor. The results are shown in the table.

	Uses Pool	Does not use Pool
Uses Gym Floor	21	15
Does not use Gym Floor	9	15

- (a) State the stage of the statistical enquiry cycle at which the gym decides to survey 60 of its members. (1)
- (b) Using the table, draw a Venn diagram to show this information. Label each region with the correct number of members. (3)



- (c) Work out the probability that a randomly selected member uses the Pool. (2)
-
- (d) The gym manager says "Most of our members use both the Pool and the Gym Floor." State the stage of the statistical enquiry cycle at which this claim is being made, and comment on whether the data supports it. (2)

(Total for Question 5 is 8 marks)

Mark scheme · S26-30min Venn Diagrams: 30-minute Pack

Question 1

- (a) **B1** 6 cao
- (a) **Answer: 6**
- (b) **M1** $9 + 6$, oe
- (b) **A1** 15 cao
- (b) **Answer: 15**
- (c) **B1** 4 cao
- (c) **Answer: 4**

Question 2

- (i) **B1** True cao
- (i) **Answer: True**
- (ii) **B1** False cao
- (ii) **Answer: False**
- (iii) **B1** True cao
- (iii) **Answer: True**
- (iv) **B1** False cao
- (iv) **Answer: False**

Question 3

- (a) **M1** $16 - 5$, oe
- (a) **A1** 11 cao
- (a) **Answer: 11**
- (b) **M1** $11 - 5$, oe
- (b) **A1** 6 cao
- (b) **Answer: 6**
- (c) **M1** $28 - (11 + 6 + 5)$, oe
- (c) **A1** 6 cao
- (c) **Answer: 6**
- (d) **M1** at least two of the four regions correctly placed, ft from (a) to (c)
- (d) **A1** all four regions correct: French only 11, Spanish only 6, both 5, neither 6
- (d) **Answer: French only = 11, Spanish only = 6, both = 5, neither = 6**

Question 4

- (a) **M1** $12 + x + 9 + 7 = 40$, oe
- (a) **M1** $x + 28 = 40$, oe (simplifies the left-hand side)
- (a) **A1** $x = 12$ cao
- (a) **Answer: $x = 12$**
- (b) **M1** $12/40$, oe, ft their value of x
- (b) **A1** $3/10$ oe cao
- (b) **Answer: $3/10$**

Question 5

- (a) **B1** Plan cao
- (a) **Answer: Plan**
- (b) **M1** attempts to convert the table into the four Venn regions
- (b) **A1** all four regions correct: both 21, Floor only 15, Pool only 9, neither 15
- (b) **B1** diagram fully labelled, with both circles named and the universal set shown
- (b) **Answer: Both = 21, Floor only = 15, Pool only = 9, neither = 15**
- (c) **M1** $(21 + 9)/60$, oe
- (c) **A1** $1/2$ oe cao
- (c) **Answer: $1/2$**
- (d) **B1** Interpret cao
- (d) **B1** valid comment, e.g. only 21 out of 60 members (35%) use both, which is less than half, so the data does not support the claim that most members use both, oe
- (d) **Answer: Interpret; the claim is not well supported, since only 21 of the 60 members (35%) use both facilities, which is less than half.**