



S26-test Venn Diagrams: Test Pack

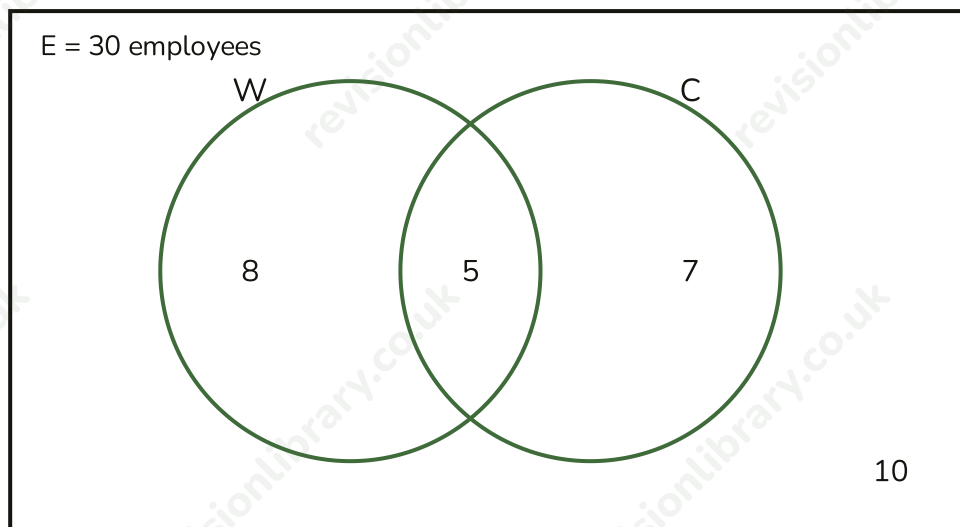
EDEXCEL 1ST0 · Calculator allowed · about 20 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1 30 employees at a company were asked whether they walk (W) or cycle (C) to work. The Venn diagram shows the results.



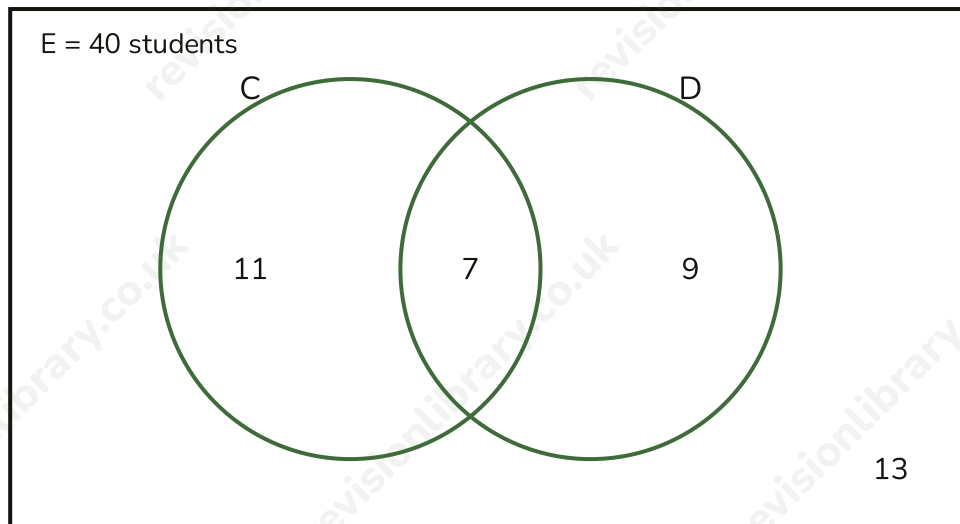
- (a) Write down the number of employees who walk and cycle to work. (1)

- (b) Write down the number of employees who neither walk nor cycle to work. (1)

- (c) Work out the total number of employees who walk to work (whether or not they also cycle). (2)

(Total for Question 1 is 4 marks)

- 2 40 students were asked whether they own a cat (C) or a dog (D). The Venn diagram shows the results.



- (a) Work out the probability that a randomly selected student owns neither a cat nor a dog. (2)

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- (b) Work out the probability that a randomly selected student owns a dog. (2)

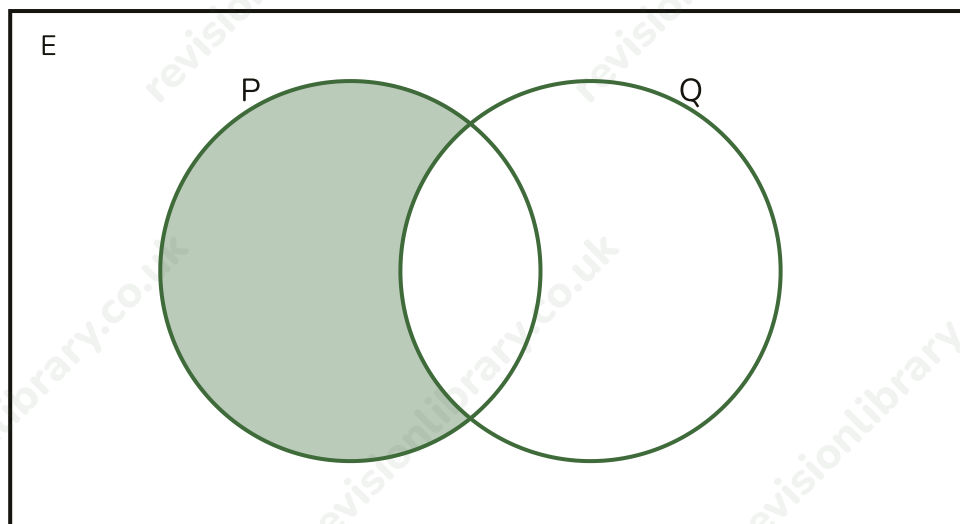
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- (c) Work out the probability that a randomly selected student owns both a cat and a dog. (1)

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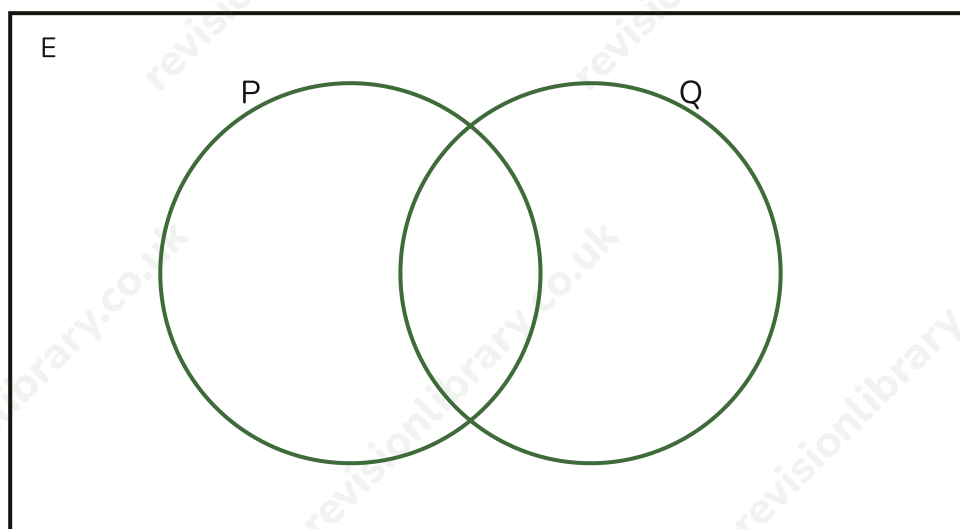
(Total for Question 2 is 5 marks)

- 3** The Venn diagram shows two sets, P and Q, inside the universal set E. A region has been shaded.



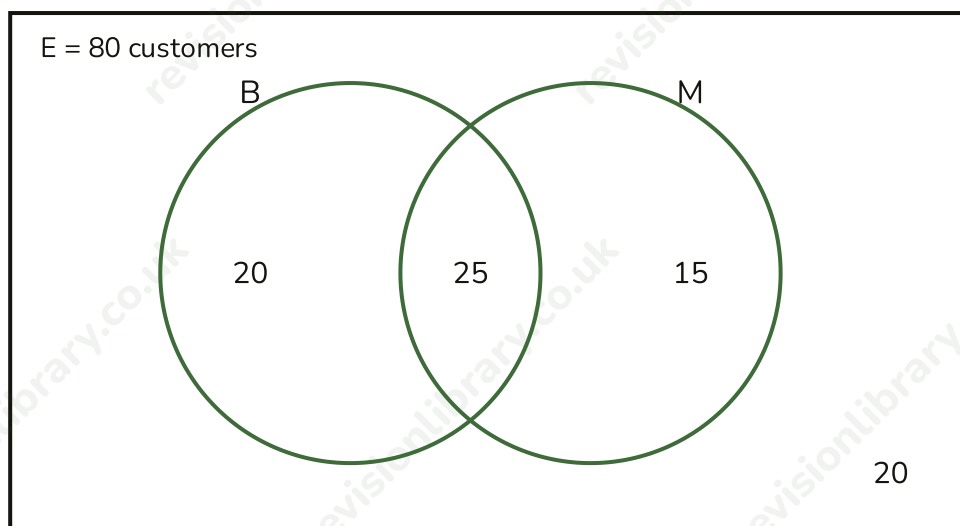
- (a)** Write down, using set notation, the shaded region. (2)

- (b)** On the diagram provided, shade the region $(P \cup Q)'$. (2)



(Total for Question 3 is 4 marks)

- 4 80 customers at a supermarket were asked whether they bought Bread (B) or Milk (M) that day. The Venn diagram shows the results.



- (a) Find $P(B)$, $P(M)$ and $P(B \text{ intersect } M)$, giving each as a fraction in its simplest form. (3)
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- (b) Two events are independent if $P(A \text{ intersect } B) = P(A) \times P(B)$. Determine, with justification, whether buying bread and buying milk are independent events for these customers. (2)

(Total for Question 4 is 5 marks)

Mark scheme · S26-test Venn Diagrams: Test Pack

Question 1

- (a) **B1** 5 cao
- (a) **Answer: 5**
- (b) **B1** 10 cao
- (b) **Answer: 10**
- (c) **M1** $8 + 5$, oe
- (c) **A1** 13 cao
- (c) **Answer: 13**

Question 2

- (a) **M1** $13/40$, oe (identifies the neither region out of 40)
- (a) **A1** $13/40$ cao
- (a) **Answer: $13/40$**
- (b) **M1** $(9 + 7)/40$, oe
- (b) **A1** $2/5$ oe cao
- (b) **Answer: $2/5$**
- (c) **B1** $7/40$ cao
- (c) **Answer: $7/40$**

Question 3

- (a) **M1** identifies the shaded region as inside P and outside Q
- (a) **A1** P intersect Q' oe cao
- (a) **Answer: P intersect Q'**
- (b) **B2** only the region outside both circles (but inside the rectangle) shaded, B1 for shading that also includes part of a circle
- (b) **Answer: The region outside both circles, inside the rectangle, is shaded.**

Question 4

- (a) **B1** $P(B) = 9/16$ cao
- (a) **B1** $P(M) = 1/2$ cao
- (a) **B1** $P(B \text{ intersect } M) = 5/16$ cao
- (a) **Answer: $P(B) = 9/16$, $P(M) = 1/2$, $P(B \text{ intersect } M) = 5/16$**
- (b) **M1** $9/16 \times 1/2 = 9/32$, oe, ft their probabilities from (a)
- (b) **A1** compares $9/32$ with $P(B \text{ intersect } M) = 5/16 = 10/32$ and concludes not independent, since $9/32$ is not equal to $10/32$
- (b) **Answer: Not independent, since $P(B) \times P(M) = 9/32$, which is not equal to $P(B \text{ intersect } M) = 5/16 (= 10/32)$.**