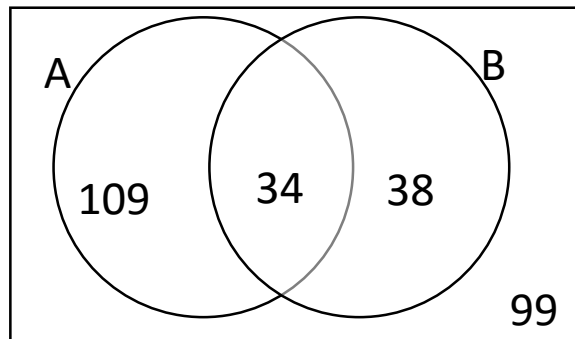


Venn Diagrams

1. You are given that the $P(A) = 0.4$. Calculate $P(A')$

/1

The diagram shows the number of students in a year group who are female (set A) and the number of left handed students in the same year group (set B).



2. Write down the $P(A \cap B)$.

/1

3. Write down the $P(A \cup B)$.

/1

4. How many students are in the year group altogether?

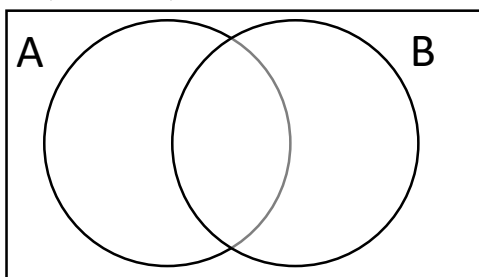
/2

5. A student is chosen at random from the year group. What is the probability that the student is a right-handed given that the student is female?

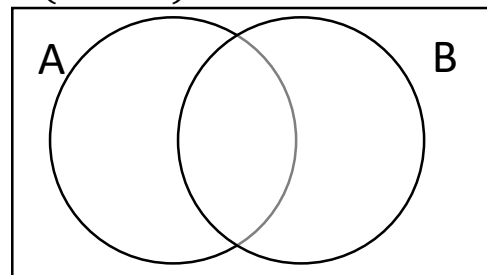
/2

6. On the Venn diagram shade the regions that represent.

a) $P(A' \cup B)$



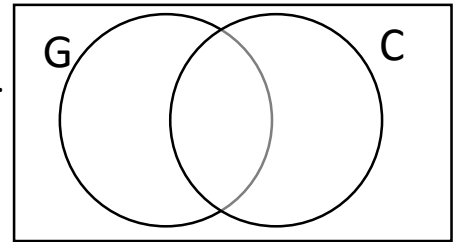
b) $P(A' \cap B)$



/2



7. A gym has 150 members.
 112 of the members use the gym.
 68 members go to the classes.
 14 of the members don't use the gym or go to classes.
 Use this information to complete the Venn Diagram.
 G represents those members who use the Gym.
 C represents those members who go to Classes.



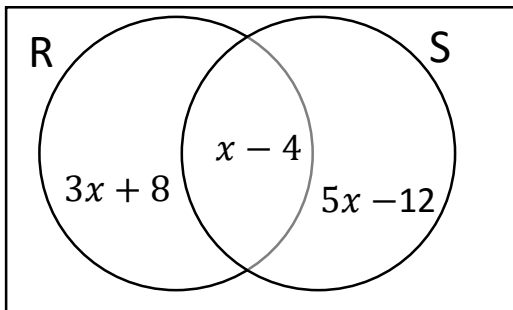
/2

- A shop is has 70 second hand books.
 19 of the books have been written on and have missing pages.
 48 of the books have been written.
 34 of the books have pages missing.

8. Work out how many of the books have not been written on and have no pages missing.

/3

9. The Venn diagram gives information about the number of elements in the set R and set S . Given that $P(R) = P(S)$, find the value of x .



/3

Skill	Questions	Score	Available Marks
Calculate $P(A)$ and $P(A')$	1		1
Understand and Calculate the $P(A \cup B)$ and $P(A \cap B)$	2,3		2
Shade areas on a Venn Diagram involving at most two sets.	6		2
Complete a Venn diagram from given information.	7		2
Solve problems using a Venn diagram approach.	4,5,8,9		10
	Total Marks		17

Answers

Venn Diagrams

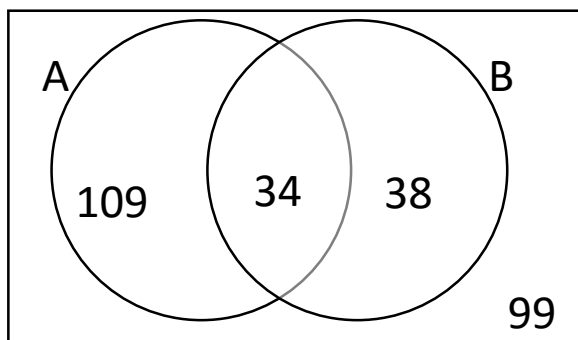


1. You are given that the $P(A) = 0.4$. Calculate $P(A')$

$$P(A') = 1 - 0.4 = 0.6$$

/1

The diagram shows the number of students in a year group who are female (set A) and the number of left handed students in the same year group (set B).



2. Write down the $P(A \cap B)$.

$$P(A \cap B) = \frac{34}{280} = \frac{17}{140}$$

/1

3. Write down the $P(A \cup B)$.

$$P(A \cup B) = \frac{81}{280}$$

/1

4. How many students are in the year group altogether?

$$109 + 34 + 38 + 99 = 280$$

/2

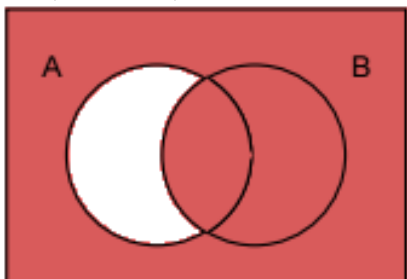
5. A student is chosen at random from the year group. What is the probability that the student is a right-handed given that the student is female?

$$P(\text{Right} | \text{Female}) = \frac{109}{143}$$

/2

6. On the Venn diagram shade the regions that represent.

a) $P(A' \cup B)$



b) $P(A' \cap B)$



/2

Answers



7. A gym has 150 members.

112 of the members use the gym.

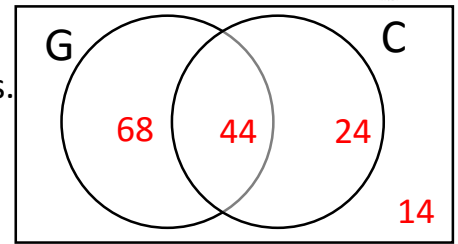
68 members go to the classes.

14 of the members don't use the gym or go to classes.

Use this information to complete the Venn Diagram.

G represents those members who use the Gym.

C represents those members who go to Classes.



$$150 - 14 = 136, \quad 112 + 68 = 180, \quad 180 - 136 = 44$$

$$112 - 44 = 68, \quad 68 - 44 = 24$$

$$\text{Check } 68 + 44 + 24 + 14 = 150$$

/2

A shop is has 70 second hand books.

19 of the books have been written on and have missing pages.

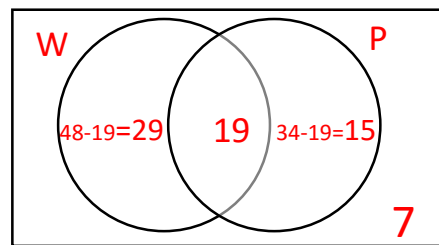
48 of the books have been written.

34 of the books have pages missing.

8. Work out how many of the books have not been written on and have no pages missing.

$$29 + 19 + 15 = 63$$

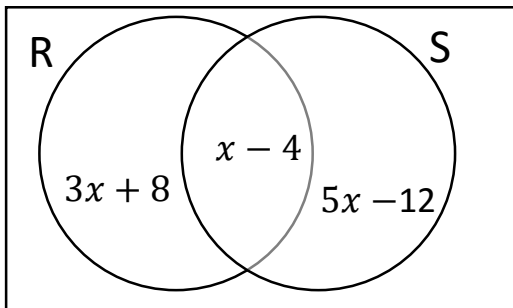
$$70 - 63 = 7$$



7 books have not been written on and have no pages missing.

/3

9. The Venn diagram gives information about the number of elements in the set R and set S. Given that $P(R) = P(S)$, find the value of x.



$$R = \{3x + 8 + x - 4\}$$

$$\text{so } R = \{4x + 4\}$$

$$S = \{5x - 12 + x - 4\}$$

$$\text{so } S = \{6x - 16\}$$

$$P(R) = P(S)$$

$$4x + 4 = 6x - 16$$

$$4 = 2x - 16$$

$$20 = 2x$$

$$10 = x$$

/3

Skill	Questions	Score	Available Marks
Calculate $P(A)$ and $P(A')$	1		1
Understand and Calculate the $P(A \cup B)$ and $P(A \cap B)$	2,3		2
Shade areas on a Venn Diagram involving at most two sets.	6		2
Complete a Venn diagram from given information.	7		2
Solve problems using a Venn diagram approach.	4,5,8,9		10
	Total Marks		