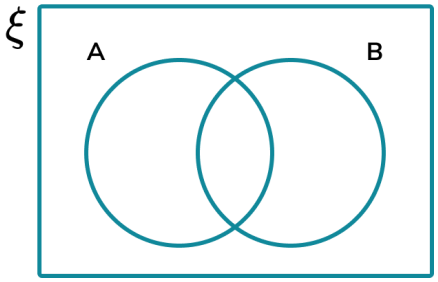
Venn Diagrams - Venn Diagrams

Skill

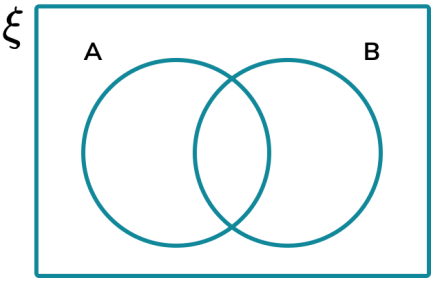
Group A - Set Notation

Shade the Venn diagram given the set notation for each question.

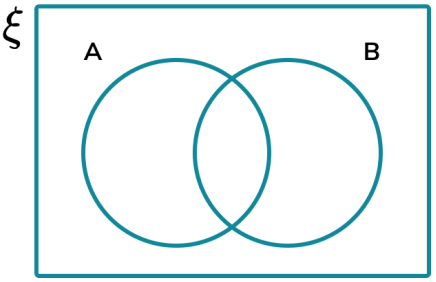
1) ξ



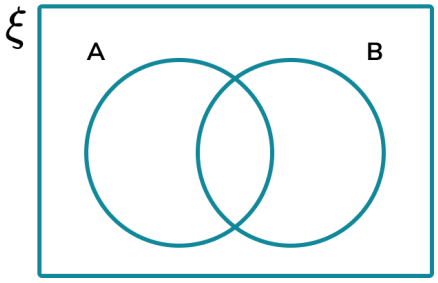
2) B



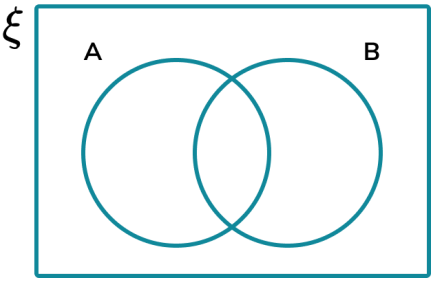
3) A'



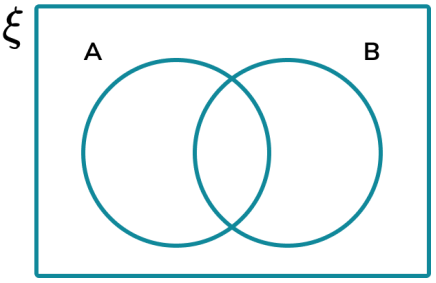
4) $A \cup B$



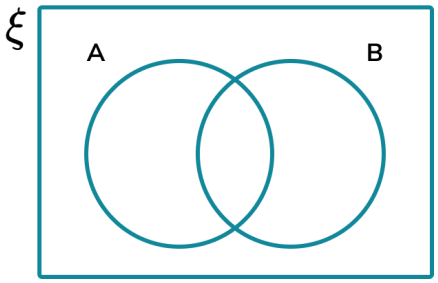
5) $A \cap B$



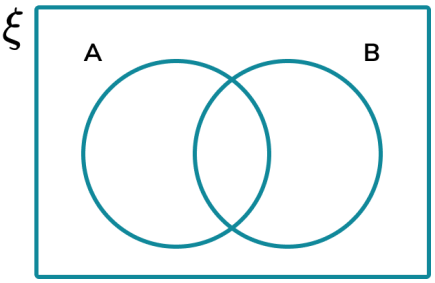
6) $A \cap B'$



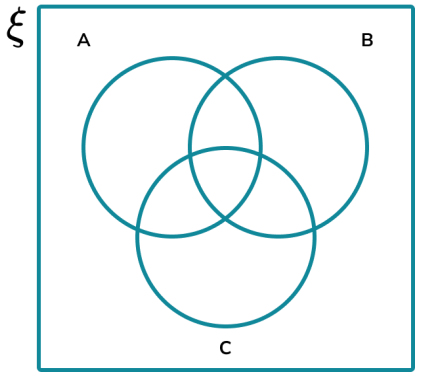
7) $(A \cup B)'$



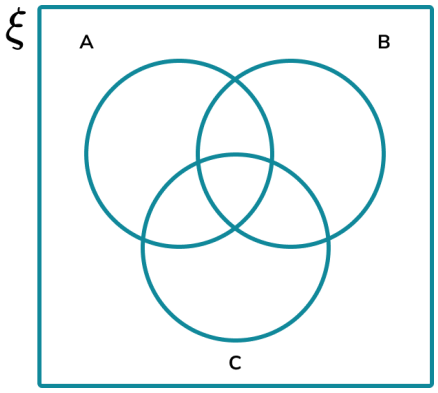
8) $A' \cap B$



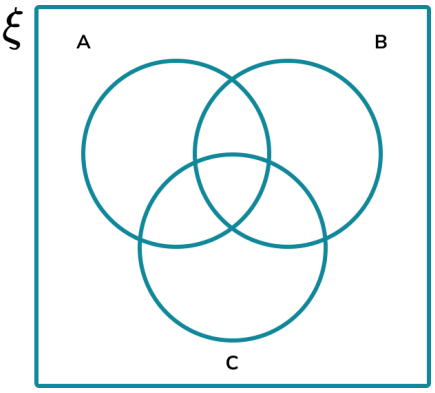
9) $A \cup B \cup C$



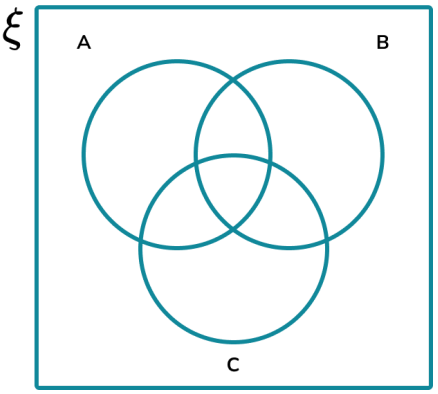
10) $(A \cap B \cap C)'$



11) $A \cup (B \cap C)$



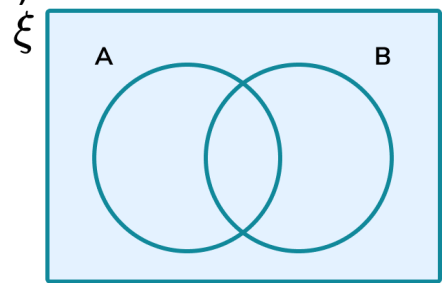
12) $A \cap (B \cup C)$



Venn Diagrams - Venn Diagrams

Group B - Shaded Regions

State the set shaded in the Venn diagram. Use the correct set notation.

1)


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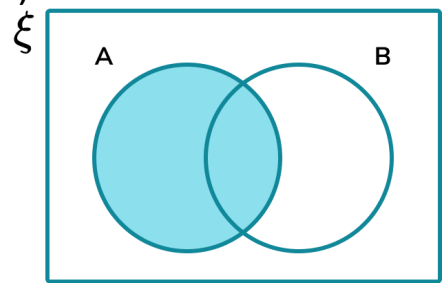
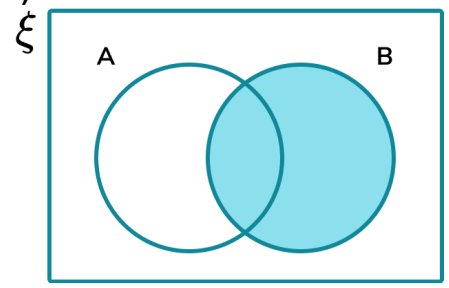
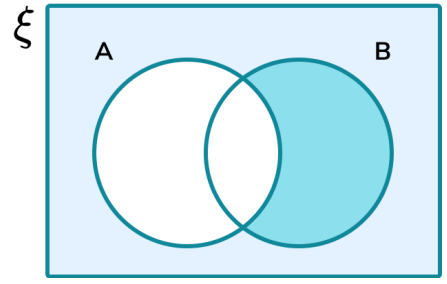
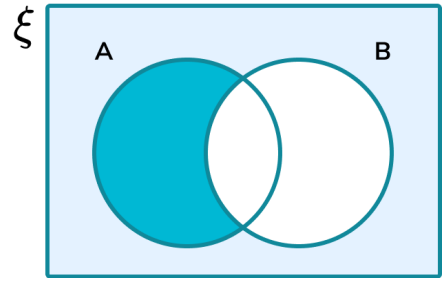
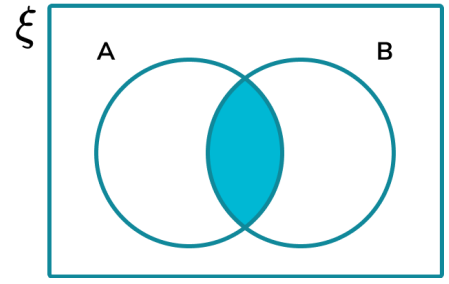
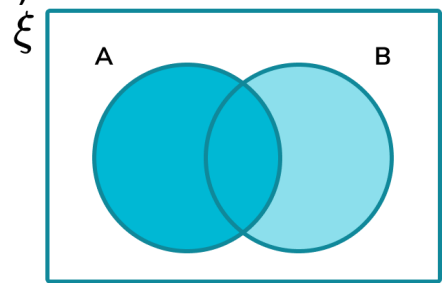


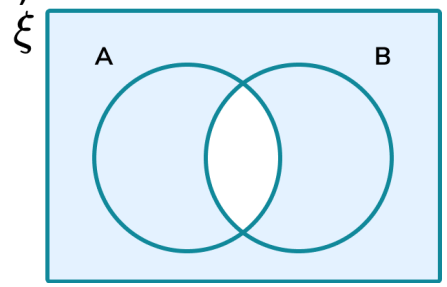
3)


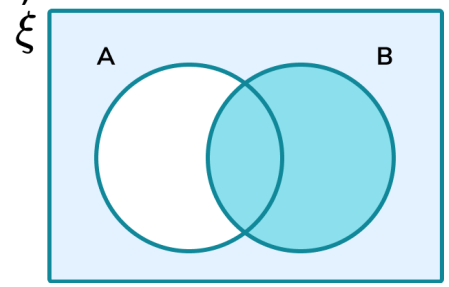
4)


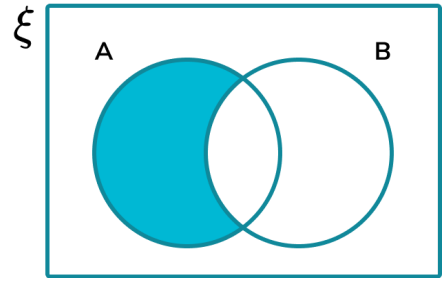
5)


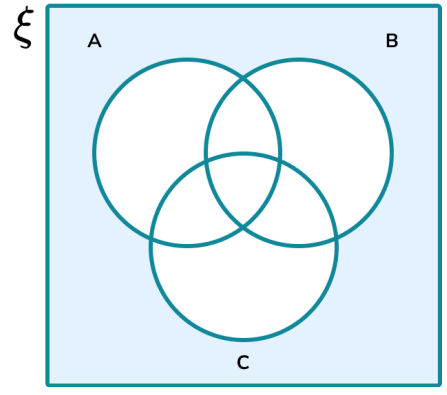
6)


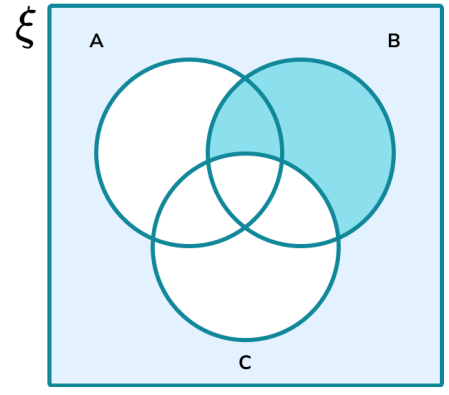
7)


8)


9)


10)


11)


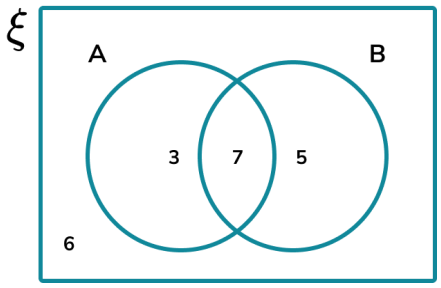
12)


Venn Diagrams - Venn Diagrams

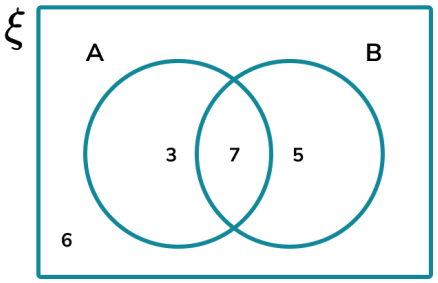
Group C - Union and Intersection

Calculate the frequency of items in each region for the following Venn diagrams.

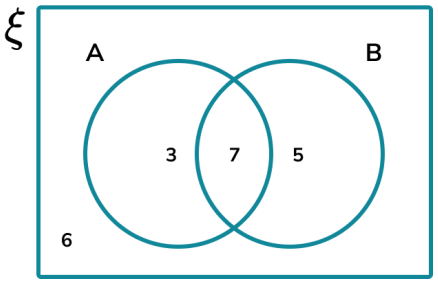
1) A



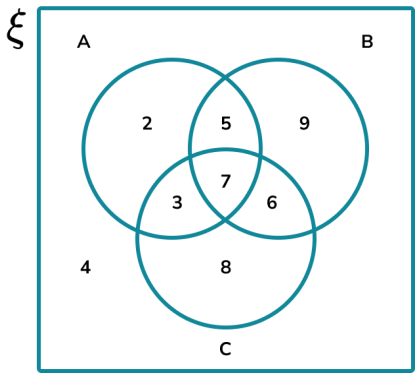
2) B'



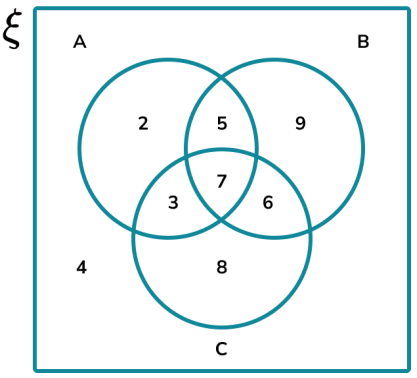
3) (A ∪ B)'



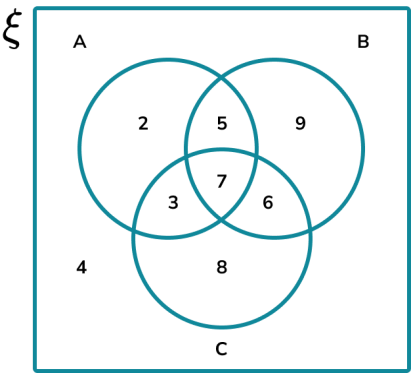
4) C



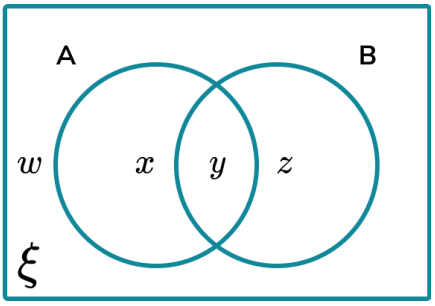
5) B ∩ C



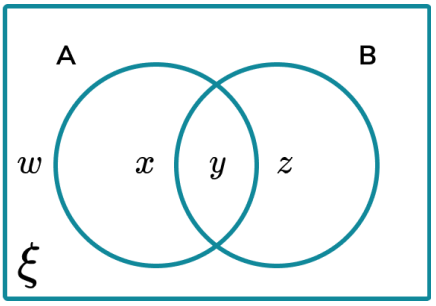
6) A ∩ B ∩ C



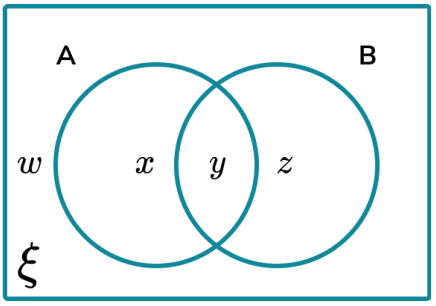
7) A ∩ B'



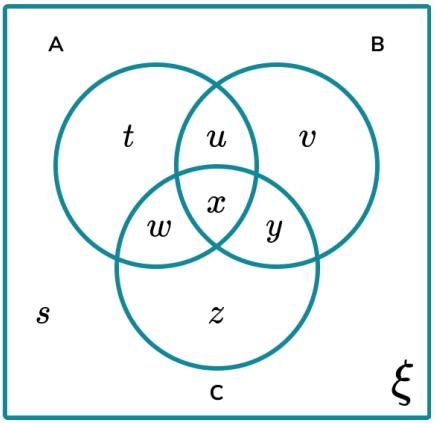
8) (A ∩ B)'



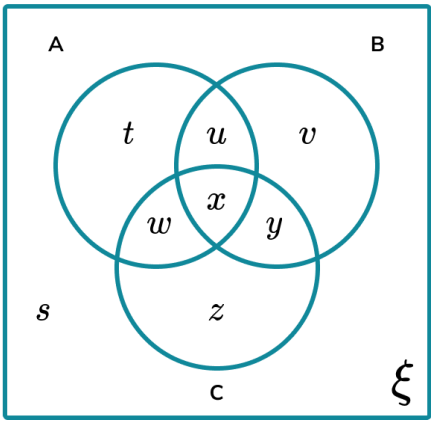
9) (A' ∪ B)'



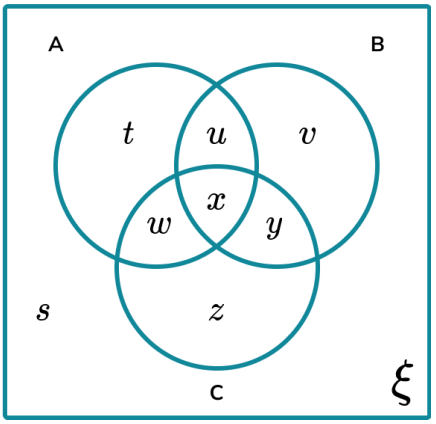
10) A ∩ B' ∩ C'



11) A ∪ (B ∪ C)'



12) B ∪ (A ∩ C')'

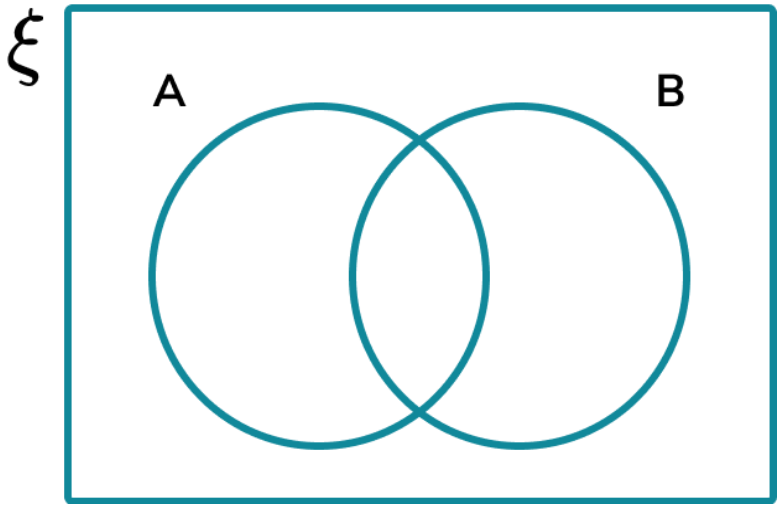


Venn Diagrams - Worksheet

Applied

1) $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
Set A = multiples of 2
Set B = multiples of 3

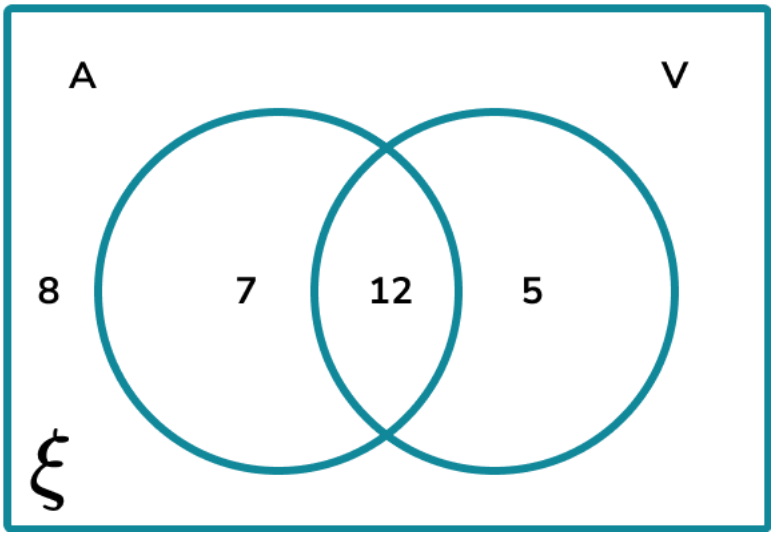
(a) Complete the Venn diagram



(b) One of the numbers is chosen at random.

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

2) A company is creating a documentary. During editing, they piece together files containing audio or video or both in the frequencies stated in the Venn diagram.

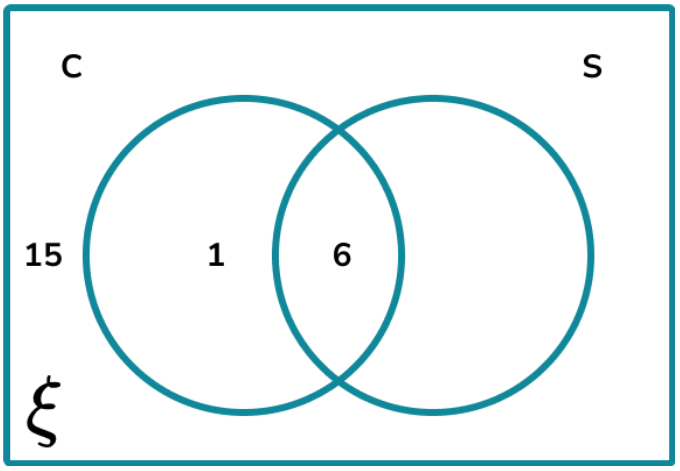


(a) How many files did **not** contain audio?

(b) How many videos were used that also contained audio?

Venn Diagrams - Worksheet

3) A comic book artist was researching how many of the 30 characters he had designed were S={Super Heroes} and how many characters wear C={Capes}. Below is a Venn diagram of his findings.

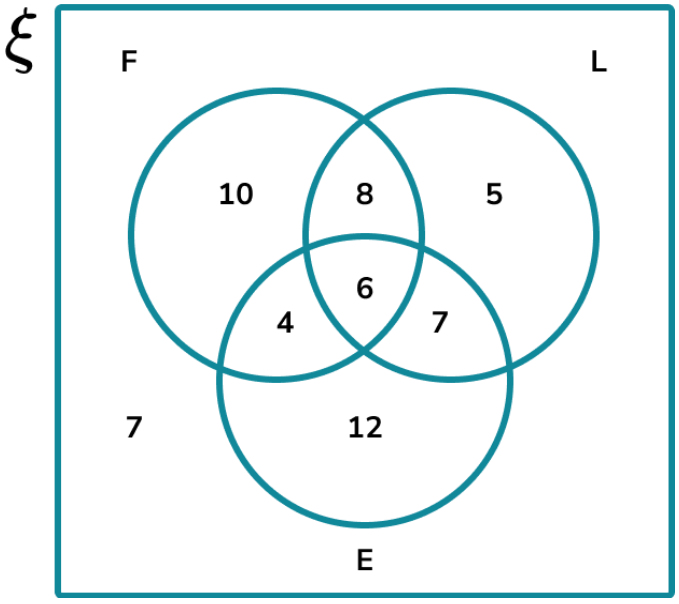


(a) Complete the Venn diagram.

(b) Calculate $P(C)$.

4) An animal charity is analysing the characteristics of their service dogs. The three characteristics are:

- F={Female}
- L={Large dog}
- E={Droopy ears}



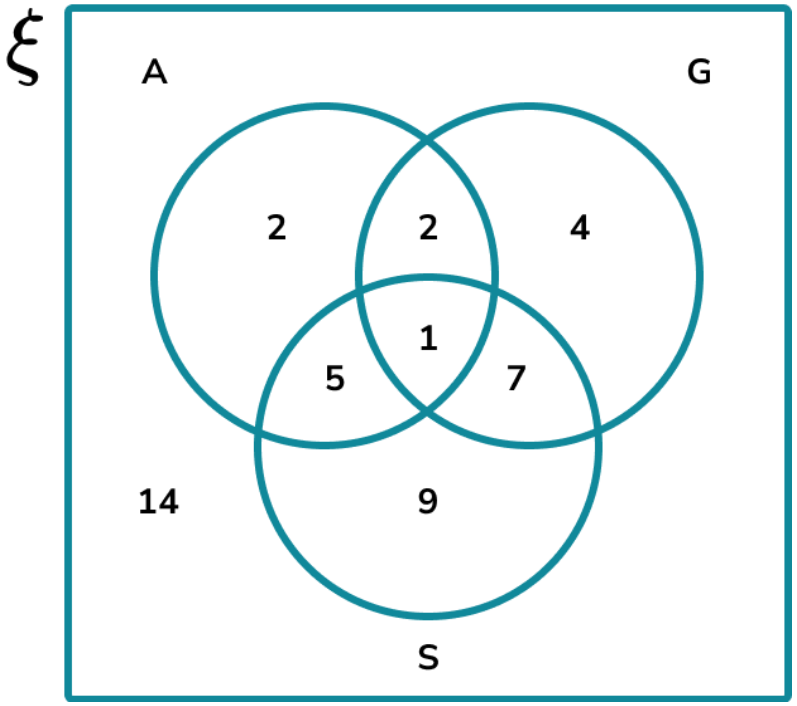
(a) How many dogs have droopy ears?

(b) Calculate the number of dogs in $(F \cup L)$.

(c) Calculate $P(F')$.

Venn Diagrams - Worksheet

5) A film critic is analysing the use of weapons in fight scenes or battles in the top 44 films of the decade. The weapons were grouped into the three categories: A={Arrows}, G={Guns} and S={Swords}. The results are shown below.



(a) Calculate $P(A \cap S \cap G')$

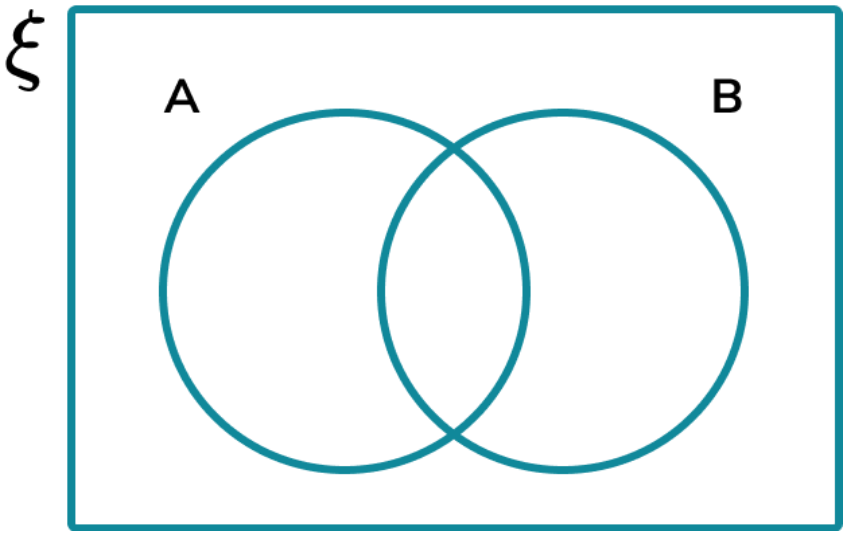
(b) Write down $P((A \cup S \cup G)')$

Venn Diagrams - Exam Questions

1) $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15\}$

Set A = multiples of 5
Set B = multiples of Prime numbers

(a) Complete the Venn diagram



(3)

(b) A number is picked at random.
Write down

(i) $P(A)$

.....

(1)

(ii) $P(A \cup B)$

.....

(1)

(5 marks)

Venn Diagrams - Exam Questions

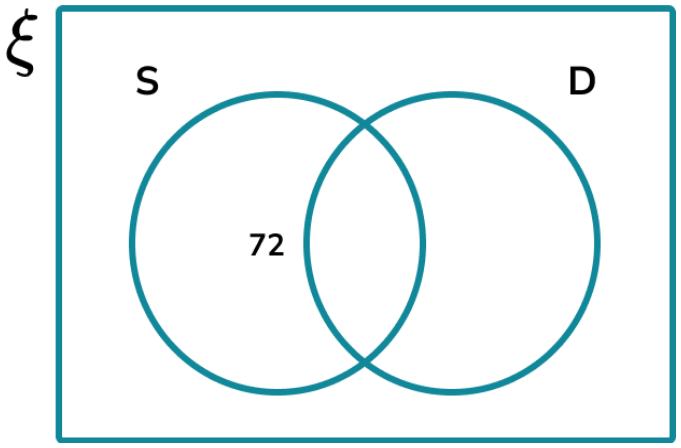
2) **(a)** A restaurant is researching how many people eat a Starter (S) or a Dessert (D). On one evening, the restaurant had 280 customers.

$\frac{1}{5}$ of customers do **not** eat a starter or a dessert,

72 had just a starter,

$\frac{3}{7}$ had both.

Complete the Venn diagram to represent this data.



(3)

(b) Calculate $P(S \cup D')$

.....

(2)

(5 marks)

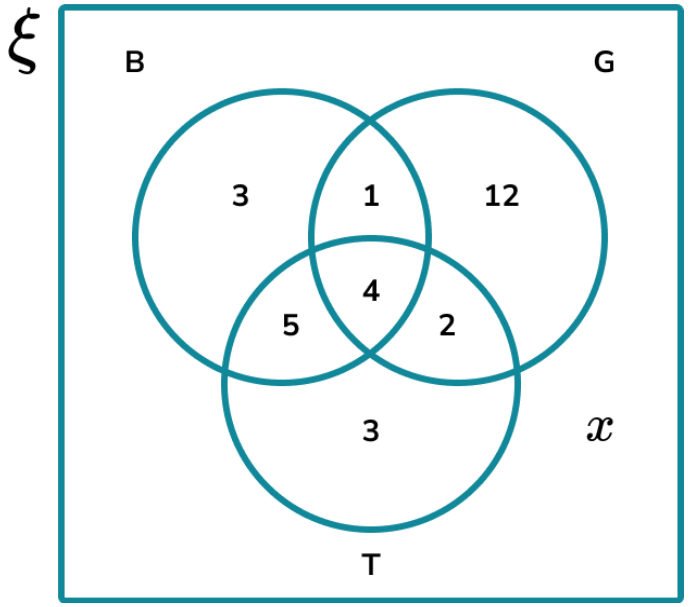
Venn Diagrams - Exam Questions

3) The Venn diagram below represents the following three sets for the 46 sports in the Olympic games:

B={Ball sports}

G={Gloves}

T={Team}



(a) Find the value of x.

x =.....

(2)

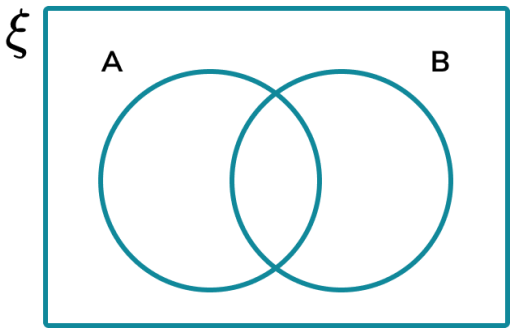
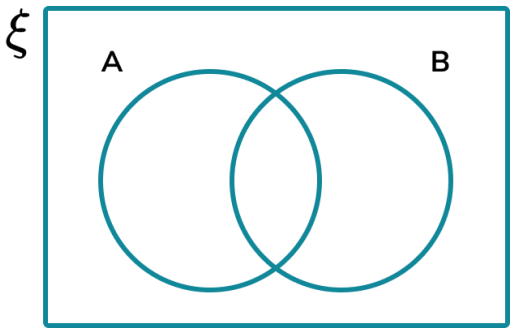
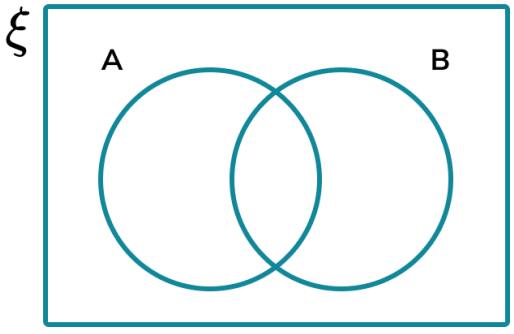
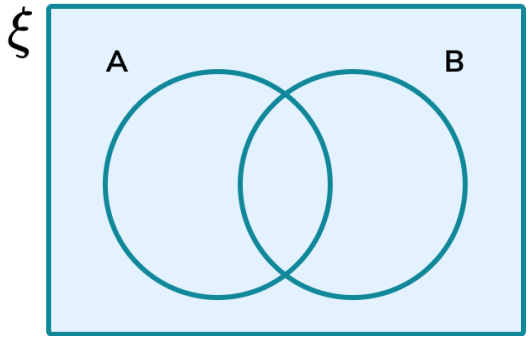
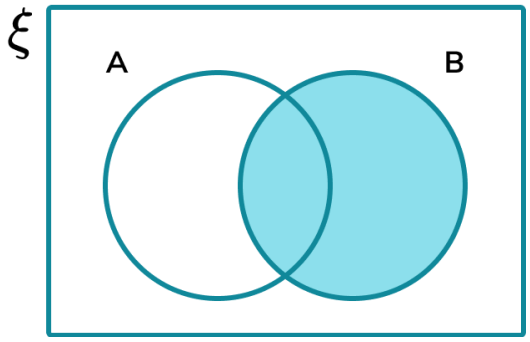
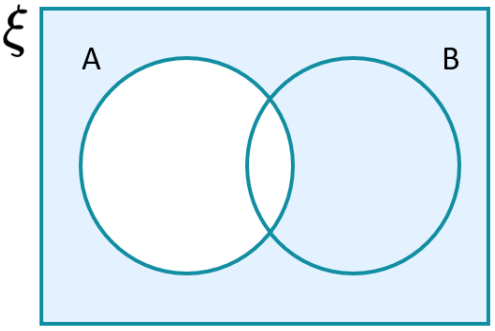
(b) Calculate B ∪ (G∩T).

.....

(2)

(4 marks)

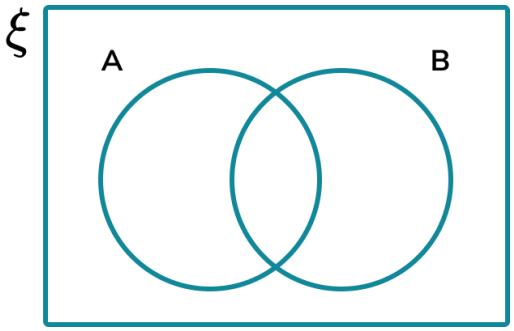
Venn Diagrams - Answers

	Question	Answer
	Skill Questions	
Group A	Shade the Venn diagram given the set notation for each question. 1) ξ  2) B  3) A' 	1)  2)  3) 

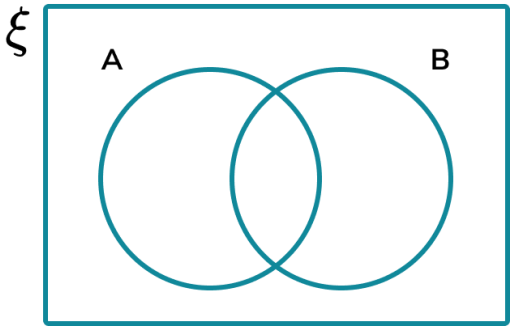
Venn Diagrams - Answers

Group A contd

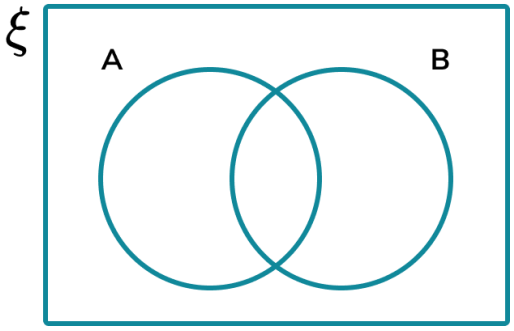
4) $A \cup B$



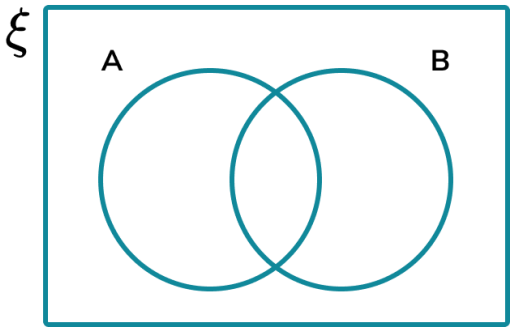
5) $A \cap B$



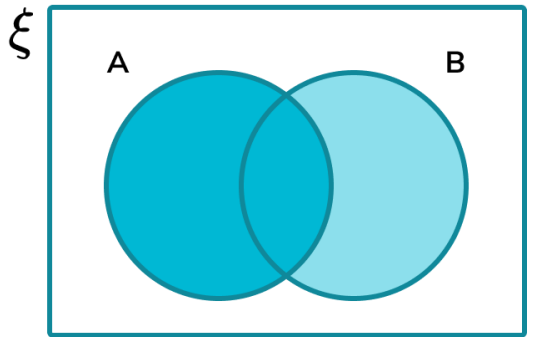
6) $A \cap B'$



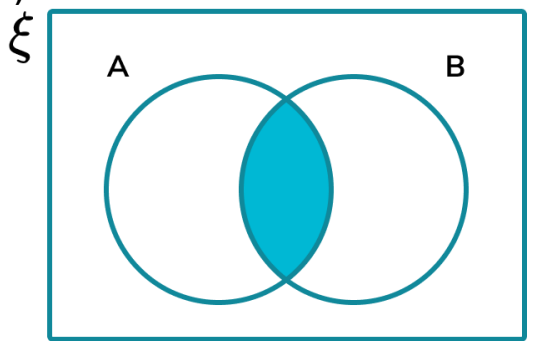
7) $(A \cup B)'$



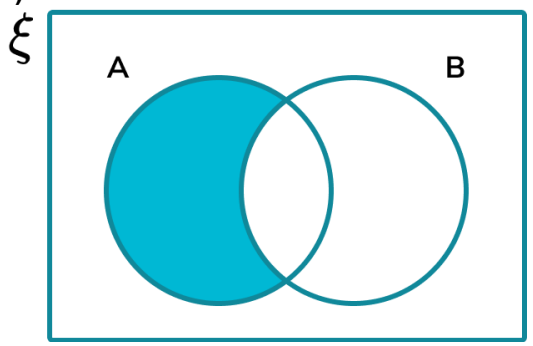
4)



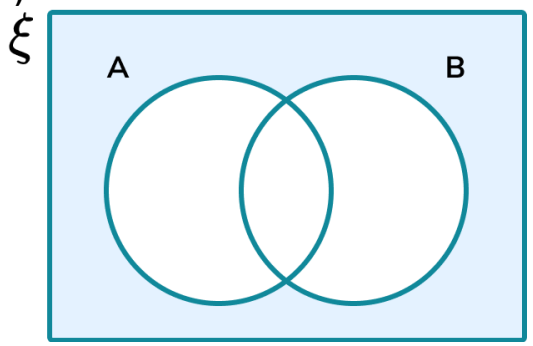
5)



6)



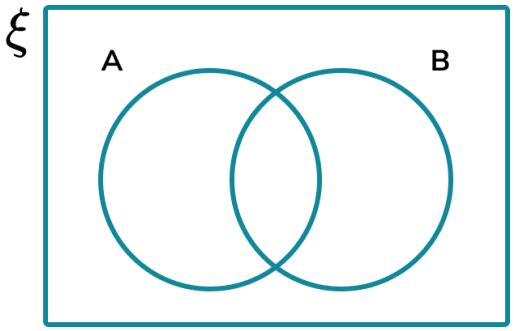
7)



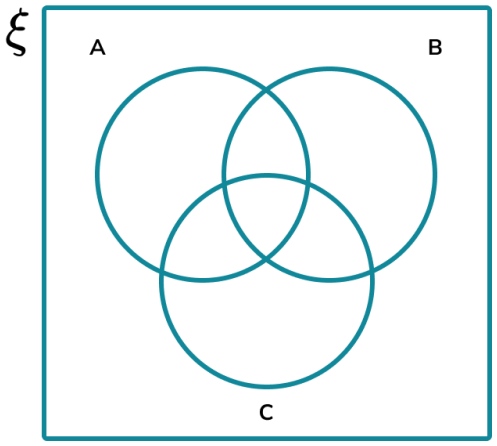
Venn Diagrams - Answers

Group A contd

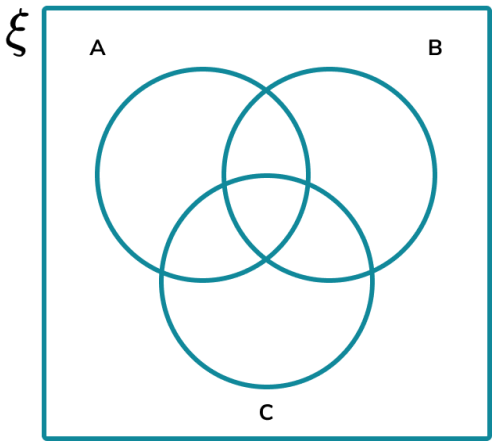
8) $A' \cap B$



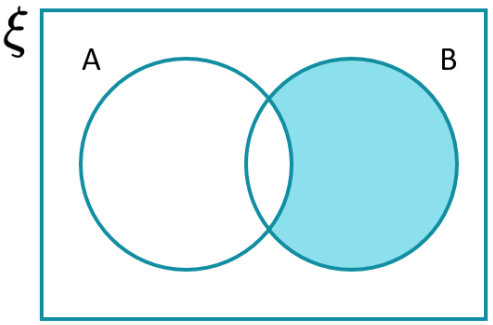
9) $A \cup B \cup C$



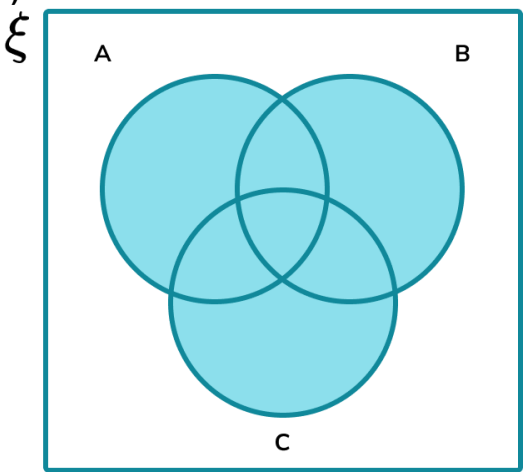
10) $(A \cap B \cap C)'$



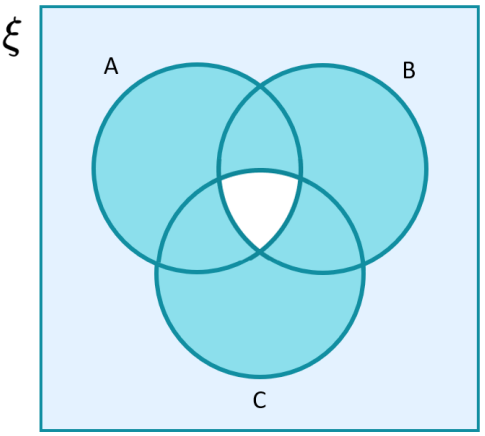
8)



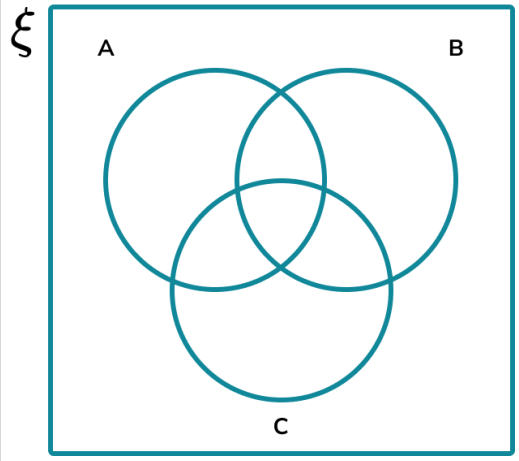
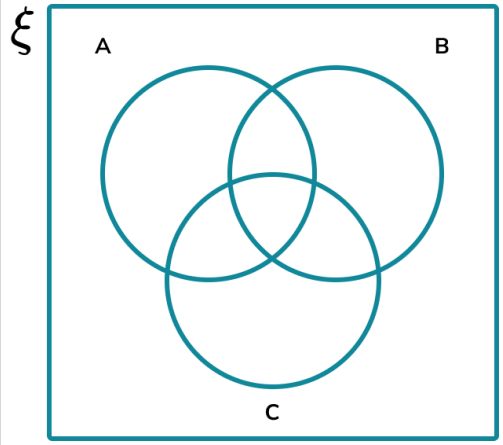
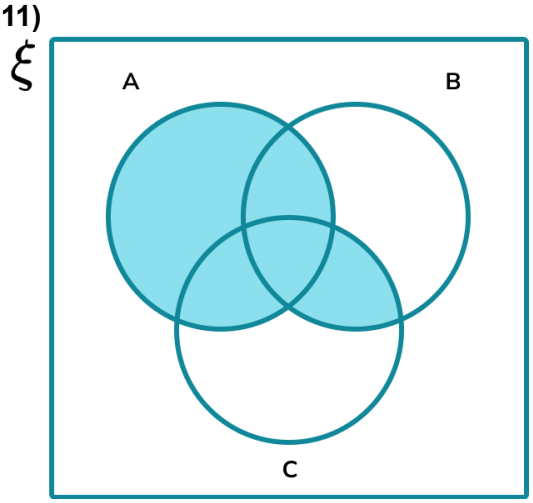
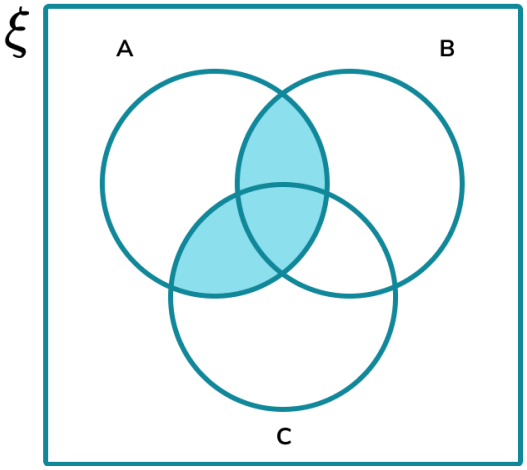
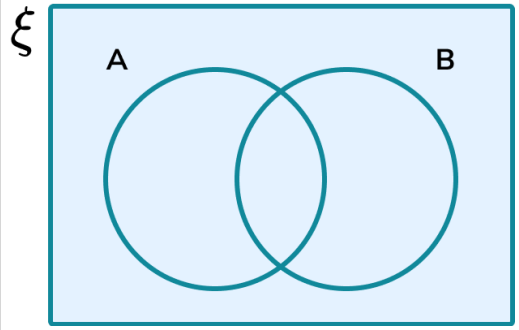
9)



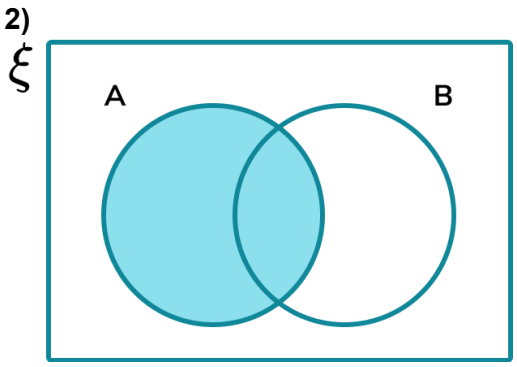
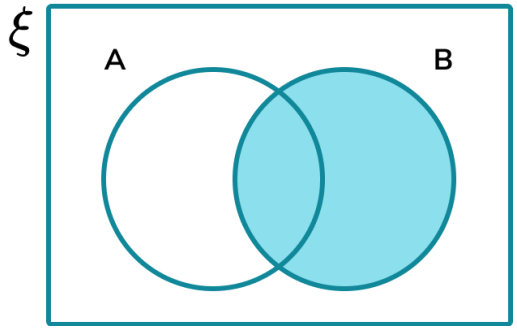
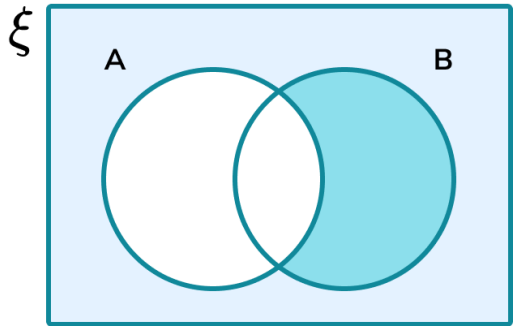
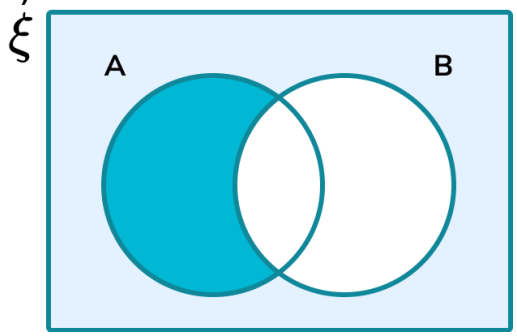
10)



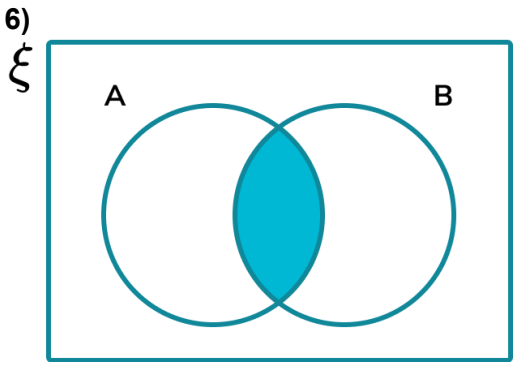
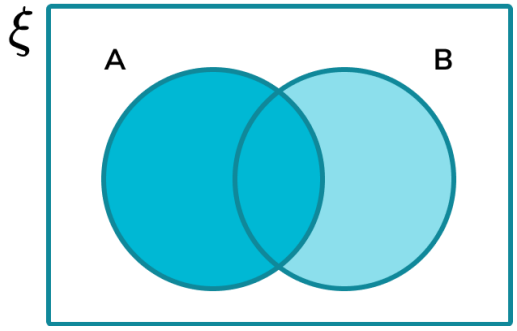
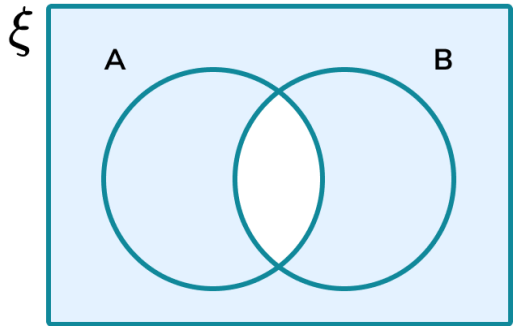
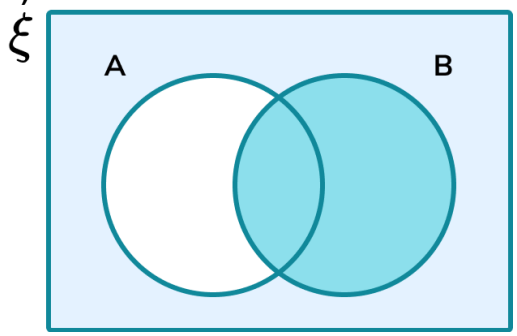
Venn Diagrams - Answers

Group A contd	**11)** $A \cup (B \cap C)$  **12)** $A \cap (B \cup C)$ 	**11)**  **12)** 
Group B	State the set shaded in the Venn diagram. Use the correct set notation. **1)** 	**1)** ξ

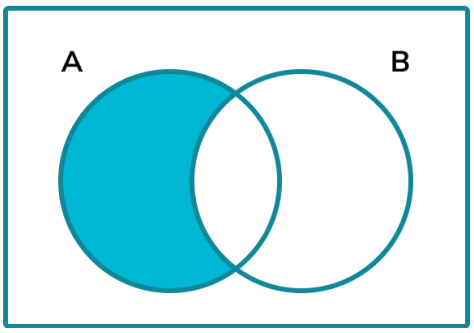
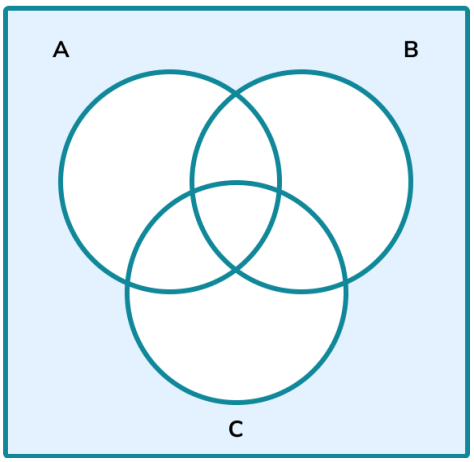
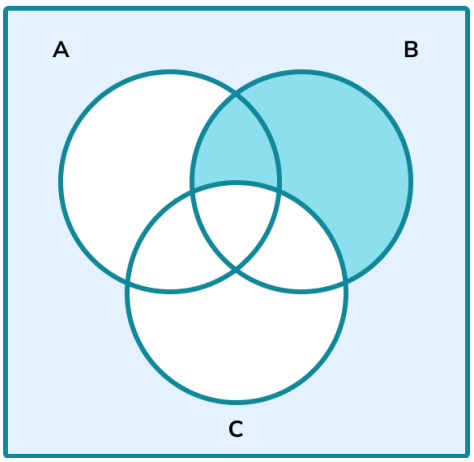
Venn Diagrams - Answers

Group B	**2)** 	**2)** A
	3) 	**3)** B
	4) 	**4)** A'
	5) 	**5)** B'

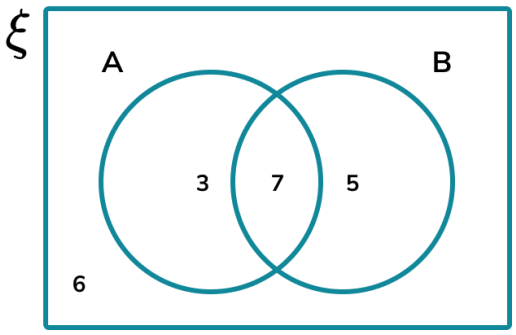
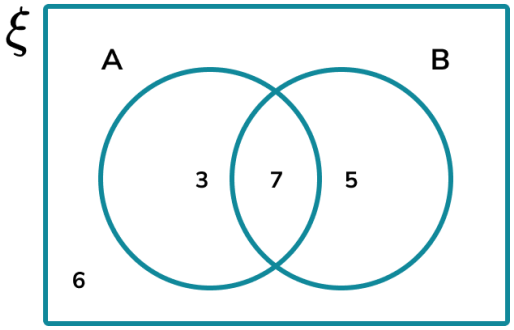
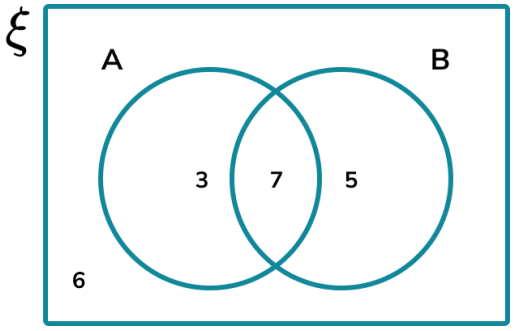
Venn Diagrams - Answers

Group B contd	6) 	6) $A \cap B$
	7) 	7) $A \cup B$
	8) 	8) $(A \cap B)'$
	9) 	9) $A'UB$

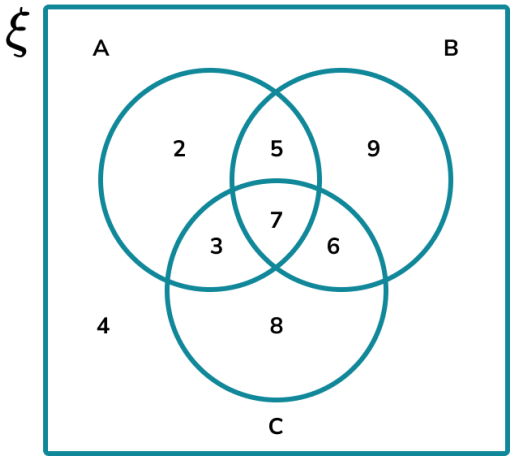
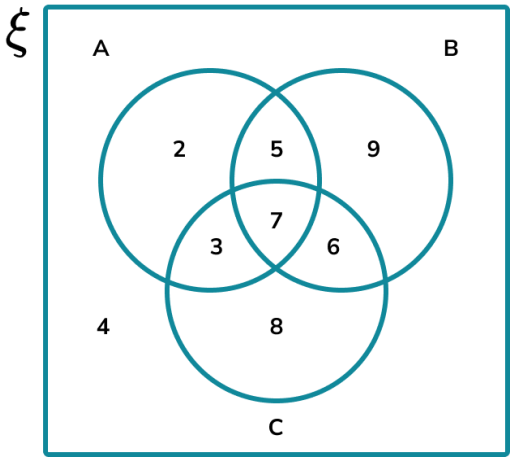
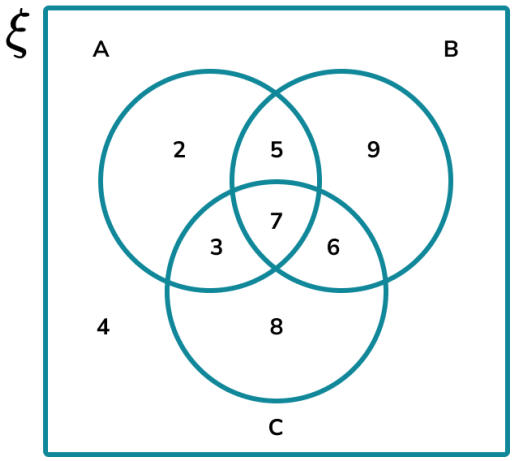
Venn Diagrams - Answers

Group B contd	**10)** ξ 	**10)** $A \cap B'$
	11) ξ 	**11)** $(AUBUC)'$
	12) ξ 	**12)** $(A'UB) \cap C'$

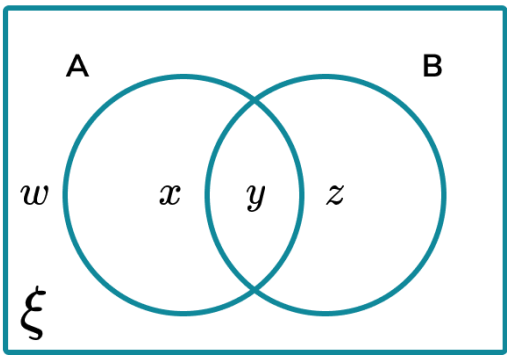
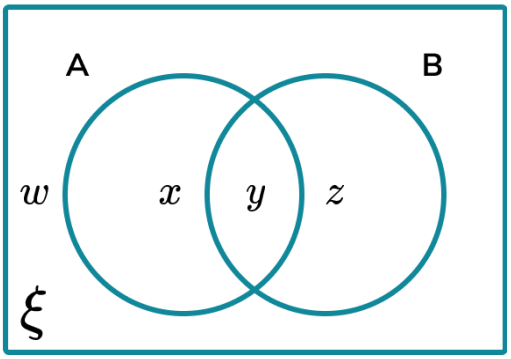
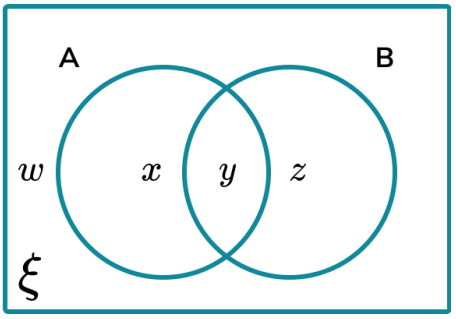
Venn Diagrams - Answers

Group C	Calculate the frequency of items in each set for the following Venn diagrams. **1)** A  **2)** B'  **3)** (A ∪ B)'  	**1)** $3 + 7 = 10$ **2)** $6 + 3 = 9$ **3)** 6

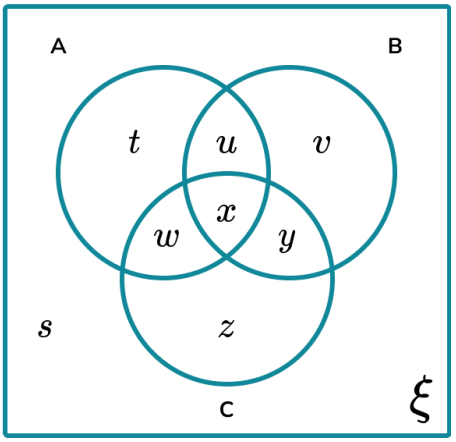
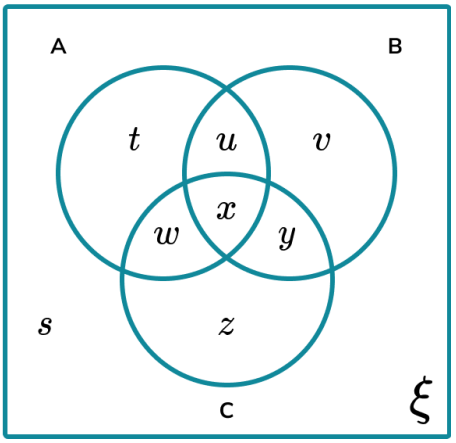
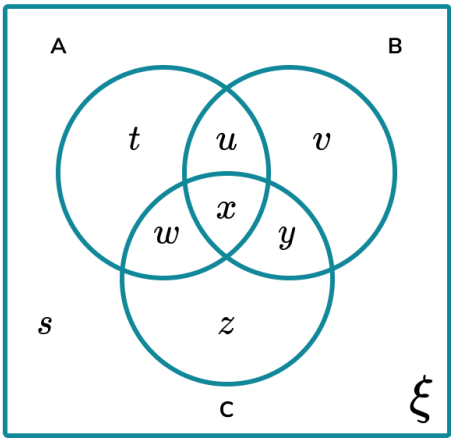
Venn Diagrams - Answers

Group C contd	**4)** C  **5)** B ∩ C  **6)** A ∩ B ∩ C  	**4)** $3 + 7 + 6 + 8 = 24$ **5)** $7 + 6 = 13$ **6)** 7

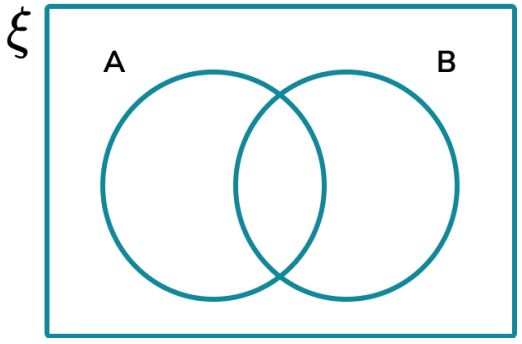
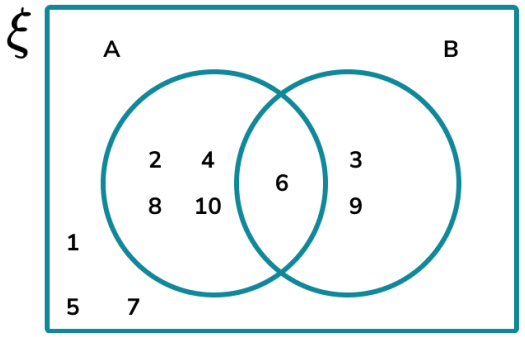
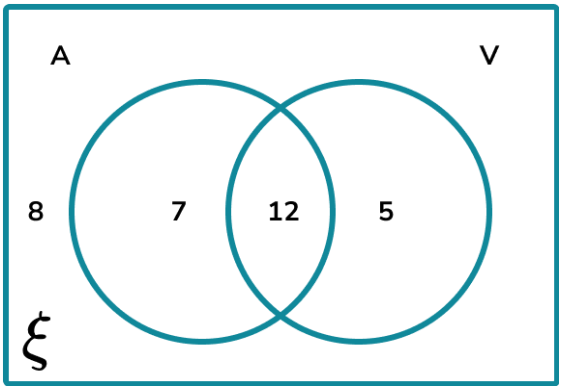
Venn Diagrams - Answers

Group C contd	**7)** $A \cap B'$  **8)** $(A \cap B)'$  **9)** $(A' \cup B)'$  	**7)** x **8)** $w + x + z$ **9)** x

Venn Diagrams - Answers

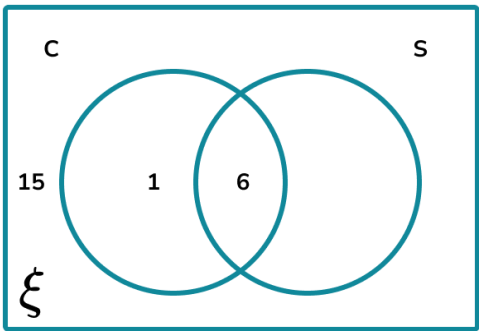
Group C contd	**10)** $A \cap B' \cap C'$ 	**10)** t
	11) $A \cup (B \cup C)'$ 	**11)** $s + t + u + w + x$
	12) $B \cup (A \cap C')'$ 	**12)** $s + u + v + w + x + y + z$

Venn Diagrams - Answers

	Question	Answer
	Applied Questions	
1)	$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ Set A = multiples of 2 Set B = multiples of 3 **a)** Complete the Venn diagram  **b)** One of the numbers is chosen at random. Write down $P(A \cap B)$.	**a)**  **b)** $P(A \cap B) = \frac{1}{10}$
2)	A company is creating a documentary. During editing, they piece together files containing audio or video or both in the frequencies stated in the Venn diagram.  **a)** How many files did not contain audio? **b)** How many videos were used that also contained audio?	**a)** $8 + 5 = 13$ **b)** 12

Venn Diagrams - Answers

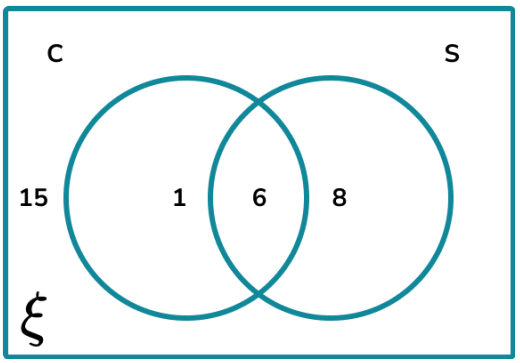
3) A comic book artist was researching how many of the 30 characters he had designed were S={Super Heroes} and how many characters wear C={capes}. Below is a Venn diagram of his findings.



a) Complete the Venn diagram.

b) Calculate $P(C)$.

a)

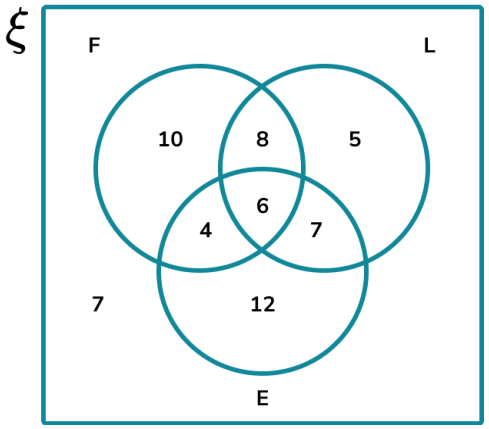


b) $P(C) = \frac{7}{30}$

Venn Diagrams - Answers

4) An animal charity is analysing the characteristics of their service dogs. The three characteristics are:

- F={Female}
- L={Large dog}
- E={Droopy ears}



a) How many dogs have droopy ears?

b) Calculate the number of dogs in $F \cup L$.

c) Calculate $P(F')$.

a) $12 + 4 + 6 + 7 = 29$

b) $28 + 5 + 7 = 40$

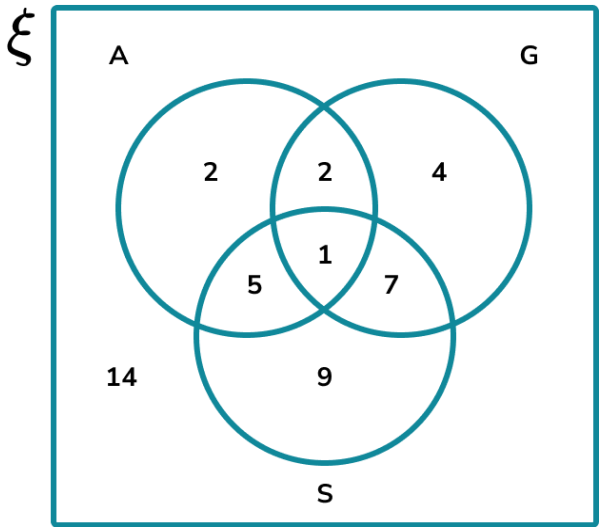
c) Number of dogs in region $F' = 5 + 7 + 12 + 7 = 31$

Total number of dogs $= 59$

$P(F') = \frac{31}{59}$

Venn Diagrams - Answers

5) A film critic is analysing the use of weapons in fight scenes or battles in the top 44 films of the decade. The weapons were grouped into the three categories: A={Arrows}, G={Guns} and S={Swords}. The results are shown below.



a) Calculate $P(A \cap S \cap G')$

b) Write down $P((A \cup S \cup G)')$

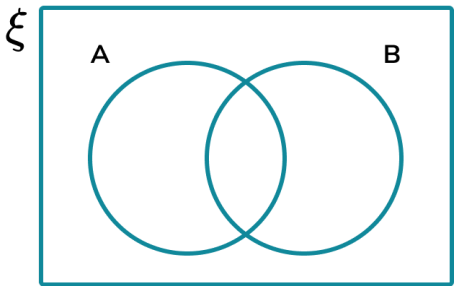
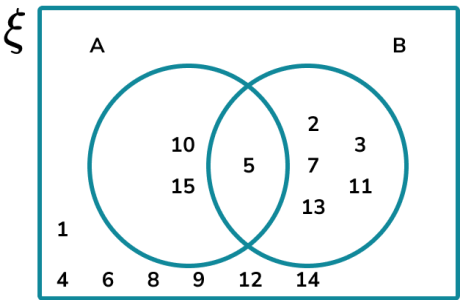
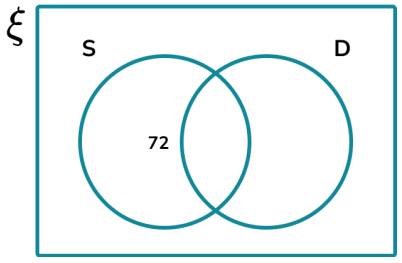
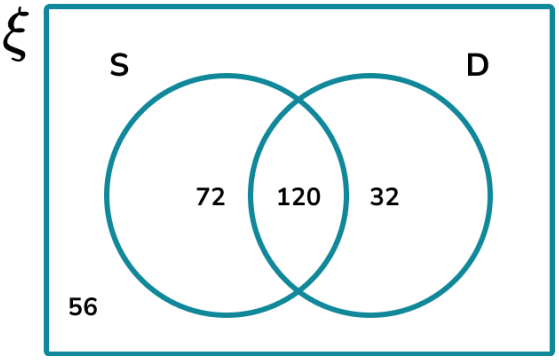
a) Number in $A \cap S \cap G' = 5$

Number in $\xi = 44$

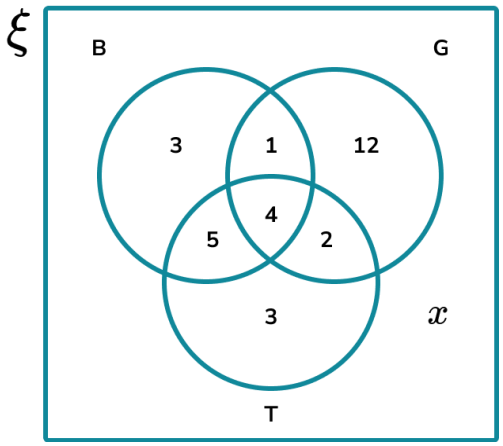
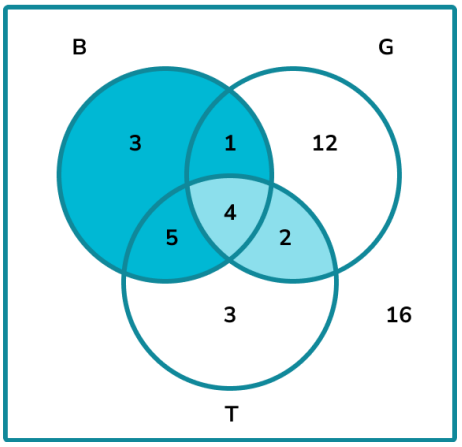
$P(A \cap S \cap G') = \frac{5}{44}$

b) $P((A \cup S \cup G)') = \frac{14}{44}$

Venn Diagrams - Mark Scheme

	Question	Answer	
	Exam Questions		
1) (a)	$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15\}$ Set A = multiples of 5 Set B = multiples of Prime numbers Complete the Venn diagram 	(a)  One region correct Two regions correct All regions correct	 (1) (1) (1)
(b)	A number is picked at random. Write down **(i)** $P(A)$ **(ii)** $P(A \cup B)$	**(b)** **(i)** $\frac{3}{15}$ or $\frac{1}{5}$ **(ii)** $\frac{8}{15}$	 (1) (1)
2) (a)	A restaurant is researching how many people eat a Starter (S) or a Dessert (D). On one evening, the restaurant had 280 customers. $\frac{1}{5}$ of customers do not eat a starter or a dessert, 72 had just a starter, and $\frac{3}{7}$ had both. Draw a Venn diagram to represent this data. 	(a) $280 \times \frac{1}{5} = 56$ $280 \times \frac{3}{7} = 120$ $280 - (56 + 72 + 120) = 32$ 	(1) (1) (1)
(b)	Calculate P(S ∪ D').	(b) S ∪ D'= 248 $P(S \cup D') = \frac{248}{280}$	(1) (1)

Venn Diagrams - Mark Scheme

3) (a)	The Venn diagram below represents the following three sets for the 46 sports in the Olympic games: B={Ball sports} G={Gloves} T={Team}  Find the value of x	**(a)** $3 + 1 + 12 + 5 + 4 + 2 + 3 = 30$ $46 - 30$ $= 16$	**(1)** **(1)**
(b)	Calculate B ∪ (G∩T).	**(b)**  $3 + 1 + 4 + 5 + 2$ **(1)** $= 15$	**(1)** **(1)**