



ACHIEVE ACADEMY

GCSE Maths — Foundation Tier

Venn Diagrams & Set Notation · Practice Booklet

NAME:

CLASS:

DATE:

☐ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Venn Diagrams & Set Notation

Total marks available: 64

● Venn Diagrams & Set Notation

✓6

Q1 · ● Developing · 1 mark

METHOD

Read the region for students who study History but not Geography: 6

✓4

Q2 · ● Developing · 1 mark

METHOD

Read the region for office workers who drink coffee but not tea: 4

✓2, 3, 5, 7, 11, 13

Q3 · ● Developing · 2 marks

METHOD

Numbers in set A: 2, 3, 5, 7, 11, 13

✓5, 7, 11

Q4 · ● Developing · 2 marks

METHOD

Numbers in set A but not in set B: 5, 7, 11

✓14

Q5 · ● Developing · 1 mark

METHOD

Read the region for office workers who drink neither tea nor coffee: 14

✓2, 4, 6, 8, 10, 12

Q6 · ● Developing · 2 marks

METHOD

Numbers in set B: 2, 4, 6, 8, 10, 12

✓1, 5, 7, 11

Q7 · ● Developing · 2 marks

METHOD

Numbers not in set A and not in set B: 1, 5, 7, 11

✓2

Q8 · ● Developing · 1 mark

METHOD

Read the region for children who own a bike and a scooter: 2

✓3, 6, 9, 12

Q9 · ● Developing · 2 marks

METHOD

Numbers in set B: 3, 6, 9, 12

✓13

Q10 · ● Developing · 1 mark

METHOD

Read the region for children who own neither a bike nor a scooter: 13

✓B'

Q11 · ● Secure · 1 mark

METHOD

The shaded region is B'

✓5/38

Q12 · ● Secure · 2 marks

METHOD

Number who have a cat but not a dog = 5

P = 5/38

✓ Both: 2, 4, 6; A only: 1, 3; B only: 8, 10;
outside: 5, 7, 9, 11

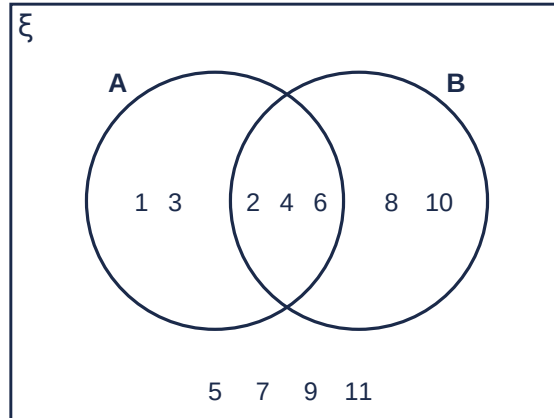
Q13 · ● Secure · 3 marks

METHOD

$A \cap B$ (in both): 2, 4, 6

A only: 1, 3; B only: 8, 10

outside both circles: 5, 7, 9, 11



✓ $A \cap B$

Q14 · ● Secure · 1 mark

METHOD

The shaded region is $A \cap B$

✓ $A \cup B$

Q15 · ● Secure · 1 mark

METHOD

The shaded region is $A \cup B$

✓ 7/30

Q16 · ● Secure · 2 marks

METHOD

Number who play football and rugby = 7

$P = 7/30$

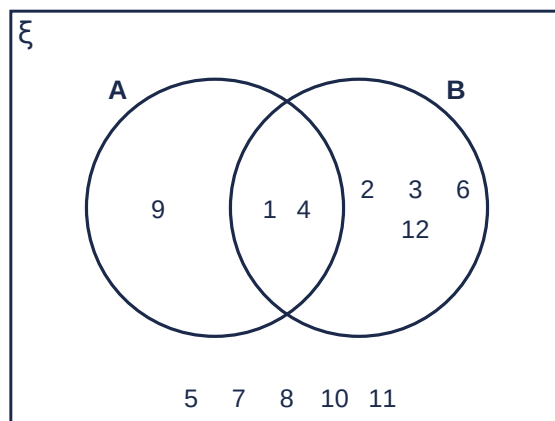
✓ Both: 1, 4; A only: 9; B only: 2, 3, 6, 12; outside: 5, 7, 8, 10, 11 Q17 · ● Secure · 3 marks

METHOD

$A \cap B$ (in both): 1, 4

A only: 9; B only: 2, 3, 6, 12

outside both circles: 5, 7, 8, 10, 11



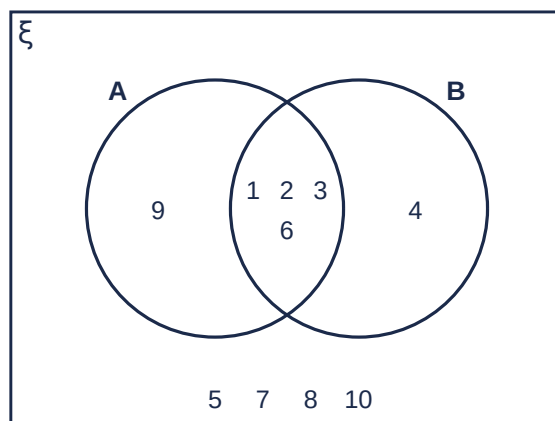
✓ Both: 1, 2, 3, 6; A only: 9; B only: 4; outside: 5, 7, 8, 10 Q18 · ● Secure · 3 marks

METHOD

$A \cap B$ (in both): 1, 2, 3, 6

A only: 9; B only: 4

outside both circles: 5, 7, 8, 10



✓ Both: 1, 2, 3, 6; A only: 4; B only: 9; outside: 5, 7, 8, 10, 11

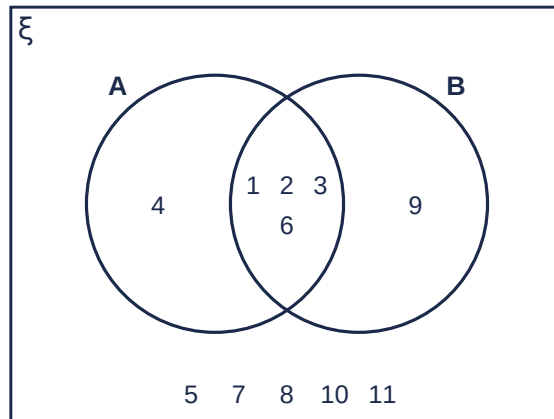
Q19 · ● Secure · 3 marks

METHOD

$A \cap B$ (in both): 1, 2, 3, 6

A only: 4; B only: 9

outside both circles: 5, 7, 8, 10, 11



✓ 14/37

Q20 · ● Secure · 2 marks

METHOD

Number who play rugby but not football = 14

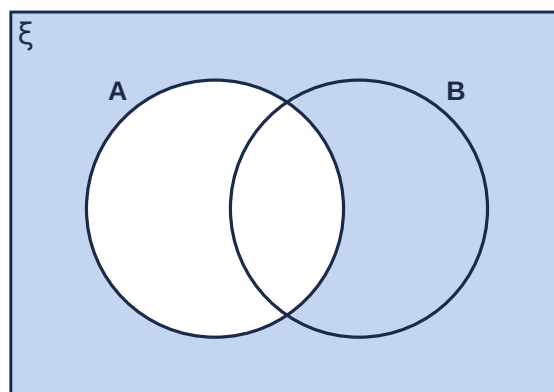
$P = 14/37$

✓ Shaded: B only, outside both circles

Q21 · ● Greater Depth · 1 mark

METHOD

A' is: B only, outside both circles



$$\checkmark x = 2$$

Q22 · ● Greater Depth · 3 marks

METHOD

$$2x + x + 3x + 8 = 20$$

$$6x = 12$$

$$x = 2$$

$$\checkmark x = 2$$

Q23 · ● Greater Depth · 3 marks

METHOD

$$x + 2x + x + 6 = 14$$

$$4x = 8$$

$$x = 2$$

✓ (a) see diagram; (b) $7/27$

Q24 · ● Greater Depth · 4 marks

METHOD

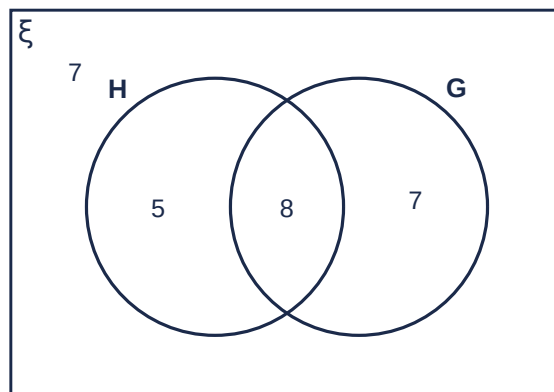
Both: 8

$$H \text{ only: } 13 - 8 = 5$$

$$G \text{ only: } 15 - 8 = 7$$

$$\text{Neither: } 27 - 5 - 8 - 7 = 7$$

$$(b) P = 7/27$$



$$\checkmark x = 3$$

Q25 · ● Greater Depth · 3 marks

METHOD

$$3x + x + 2x + 9 = 27$$

$$6x = 18$$

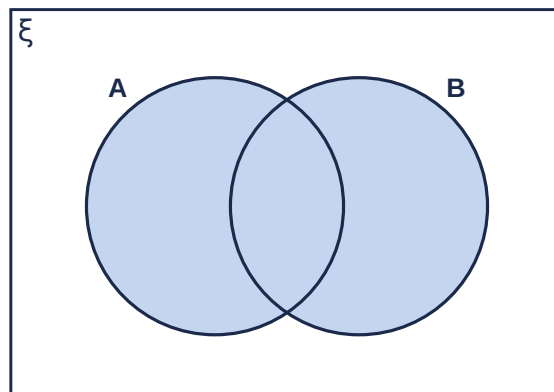
$$x = 3$$

✓ Shaded: A only, A and B, B only

Q26 · ● Greater Depth · 1 mark

METHOD

$A \cup B$ is: A only, A and B, B only



✓ (a) see diagram; (b) 10/27

Q27 · ● Greater Depth · 4 marks

METHOD

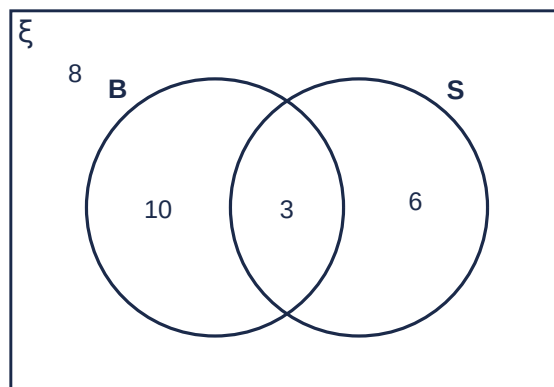
Both: 3

B only: $13 - 3 = 10$

S only: $9 - 3 = 6$

Neither: $27 - 10 - 3 - 6 = 8$

(b) $P = 10/27$



✓ (a) see diagram; (b) $1/4$

Q28 · ● Greater Depth · 4 marks

METHOD

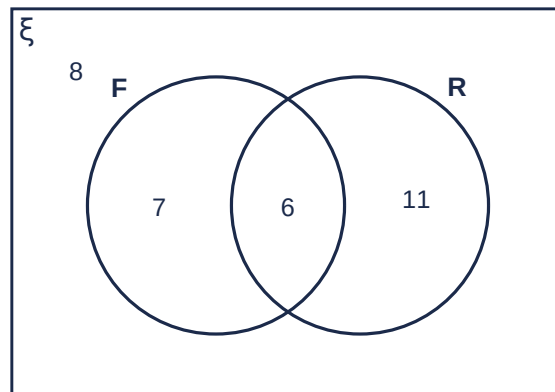
Both: 6

F only: $13 - 6 = 7$

R only: $17 - 6 = 11$

Neither: $32 - 7 - 6 - 11 = 8$

(b) $P = 8/32 = 1/4$



✓ (a) see diagram; (b) $5/32$

Q29 · ● Greater Depth · 4 marks

METHOD

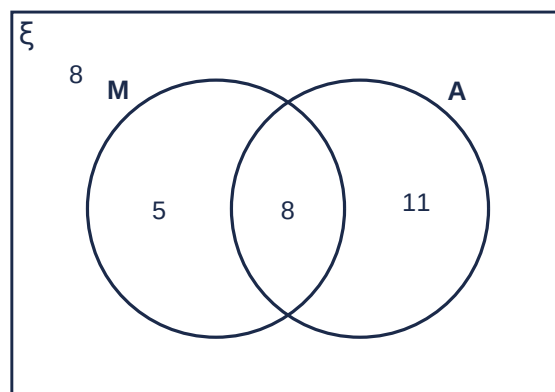
Both: 8

M only: $13 - 8 = 5$

A only: $19 - 8 = 11$

Neither: $32 - 5 - 8 - 11 = 8$

(b) $P = 5/32$



✓ Shaded: B only

Q30 · ● Greater Depth · 1 mark

METHOD

$A' \cap B$ is: B only

