Sets and Venn Diagrams Answers

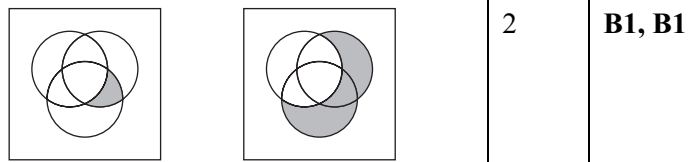1)

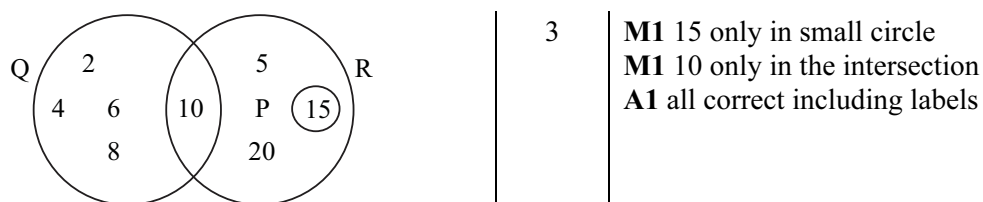| 9 (a)	$(p =)$ 5 cao, $(q =)$ 12 cao $(r =)$ 1 ft	B1 B1 B1ft	Accept in correct order if no labels ft for $r = 18 - their\ p - their\ q$ provided r not negative
(b) (i)	17 cao	B1	
(ii)	12 cao	B1	
(c) (i)	26 cao	B1	
(ii)	57 ft	B1ft	ft $45 + their\ q$
(d) (i)	$\dfrac{8}{100}$ oe isw	B1	
(ii)	$\dfrac{45}{100}$ oe isw	B1	
(e)	Any fraction with denominator 74 seen $\dfrac{37}{74} \times \dfrac{36}{73}$ $\dfrac{18}{73}$ oe isw cao	B1 M1 A1	ft *their* fraction i.e. one taken off each part $\dfrac{k}{l} \times \dfrac{k-1}{l-1}$ N.B $\dfrac{1}{2} \times \dfrac{36}{73}$ gets **B1M1** $\dfrac{1332}{5402}$ www3 (if decimal then 0.247 or better) Do not accept ratio or in words [12]

2)

	1, 1

3)

2	**B1, B1**

4)

3	**M1** 15 only in small circle **M1** 10 only in the intersection **A1** all correct including labels

5)
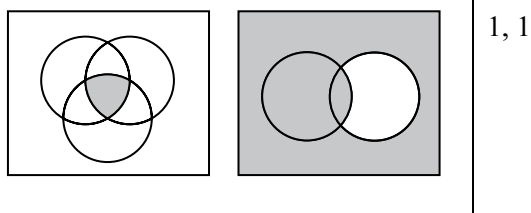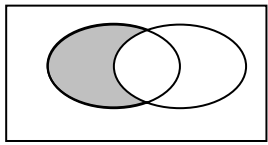
$(A \cup B \cup C)'$	1	or $A' \cap B' \cap C'$ or $A' \cap (B \cup C)'$
$(A \cup C)' \cap B$	1	or $A' \cap C' \cap B$

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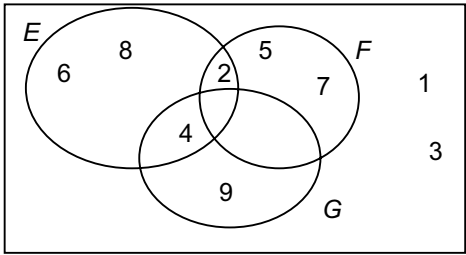
6)

(a)

| | | **1** |

(b) | 14 | | **1** |

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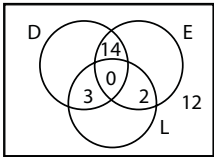
7)

(a) (i) | 180 | | **1** |

(ii) | 20 | | **1** |

(b) | 220 | | **1** |

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8)

(a) | 2 4 6 8 | | **1** |

(b) | 3 | | **1** |

(c) (i) | $(x-4)(x-9)$ | | **2** | **SC1** any other $(x+a)(x+b)$ where $a \times b = 36$ or $a+b=-13$

(ii) | 4   9 | | **B1 ft** | ft or can recover

(d)

| | | **2** | Must have all 9 numbers on diagram and no extras
| | | | **SC1** for 5 or more correct elements

(e) (i) | $\varnothing$ or { } cao | | **1** |

(ii) | $\notin$ cao | | **1** |

(iii) | $\cup$ cao | | **1** |

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9)

(a)

| 4 | **B1** 0 and 14 in correct place
| | **B1** 2 in correct place
| | **B1** 3 in correct place
| | **B1** 12 in correct place

(b) 11 | 1ft | **B1**ft 8 + their 3

(c) 23 | 1ft | **B1**ft 21 + their 2

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10)

| | 1, 1 | |

11)
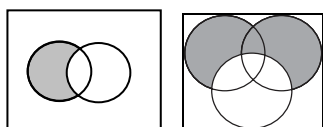
(ii) 7	**1**	
(ii) 4	**1**	
(b) $\dfrac{7}{13}$ oe	**1ft**	Ft their Venn diagram or their **(a)(i)**/13

12)

(a)
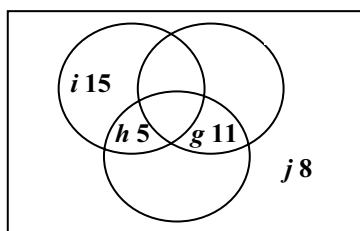
$(g =\ )\mathbf{11}$	**1**	
$(h =)\ \mathbf{5}$	**1ft**	ft 16 – their 11
$(i =\ )\mathbf{15}$	**1ft**	ft 20 – their 5
$(j =\ )\ \mathbf{8}$	**1ft**	ft 39 – (their 11 + their 5 + their 15)
		ft for positive integers only
(b) (i) 5	**1**	
(ii) 51	**1 ft**	ft 36 + their i
(c) (i) 15	**1**	
(ii) 10	**1**	

13)

(a) (i)
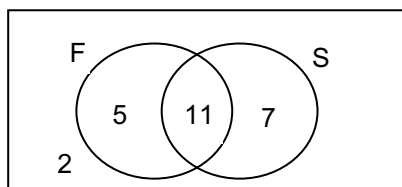
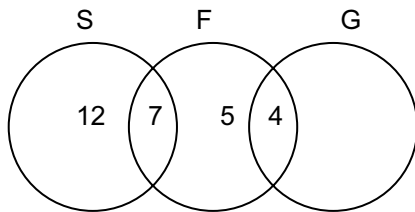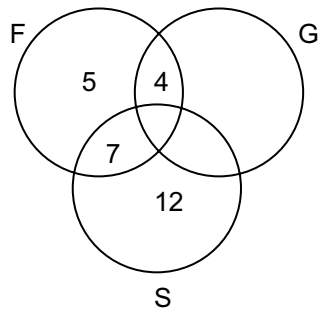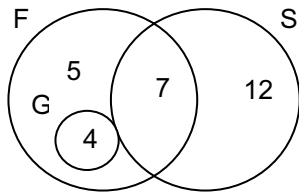|		
	2	**B1** for 2 outside of circles in diagram or all three of 5, 11, 7 correctly placed
(ii) 9	**1ft**	ft *their* 2 + *their* 7
(iii) 14	**1**	
(iv) $\dfrac{11}{25}$	**1ft**	ft *their* 11 from diagram / 25
(v) $\dfrac{42}{600}$ oe $=\dfrac{7}{100}$	**2ft**	isw incorrect cancelling
		ft *their* 7 from diagram for numerator
		M1 for $\dfrac{their\,7}{25}\times\dfrac{their(7-1)}{24}$
		After 0 scored, **SC1** for $\dfrac{their\,7}{25}\times\dfrac{their(7)}{25}$

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(b) (i)

	4	**B1** for any correct diagram with blanks or zeros where needed and labelled unambiguously **B1** for 4 in correct place **B1** for 12 in correct place **B1** for 5 and 7 in correct place
(ii) 28	**1ft**	Correct or ft from *their* diagram