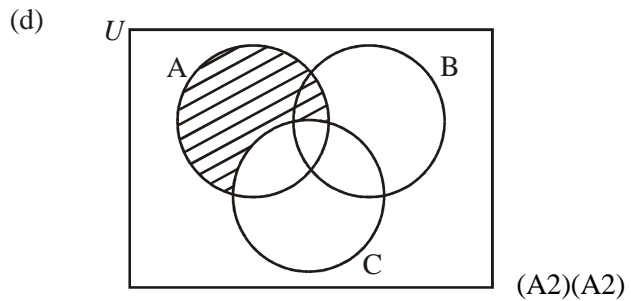
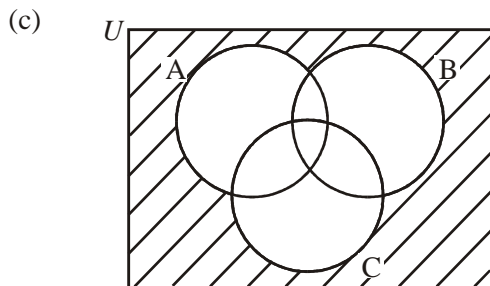
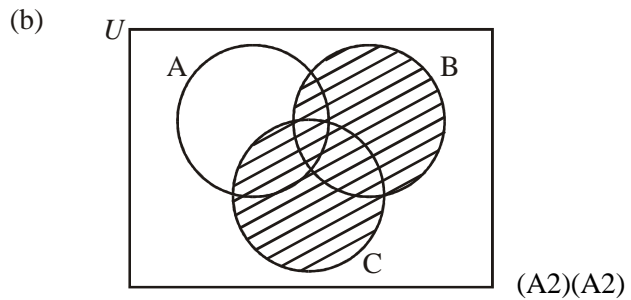
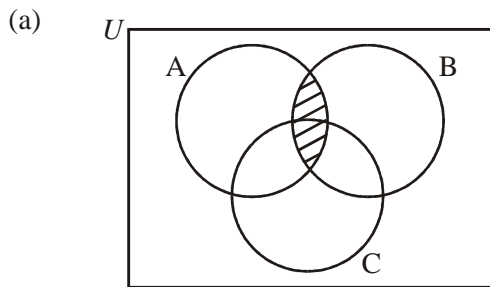


Venn Diagrams and problems ANS

0 min
0 marks

1.



Note: Award (A0), (A0), (A2) ft, (A2) ft if \cup and \cap are consistently reversed.

2.

*Note: Award (A1) for each pair of correct entries in parts (a) and (c).
A list of numbers with no set brackets is acceptable.*

- (a) $A \cup B = \{1, 3, 4, 7, 8, 9\}$ (A1)(A1)(A1) (C3)
 (b) $A \cap B \cap C = \{9\}$ (A1) (C1)
 (c) $A' = \{1, 3, 4, 7, 8, 9\}$ (A1)
 $A' \cap C = \{6, 7\}$ (A1)
 $(A' \cap C) \cup B = \{3, 6, 7, 9\}$ (A1)(A1) (C4)

[8]

3.

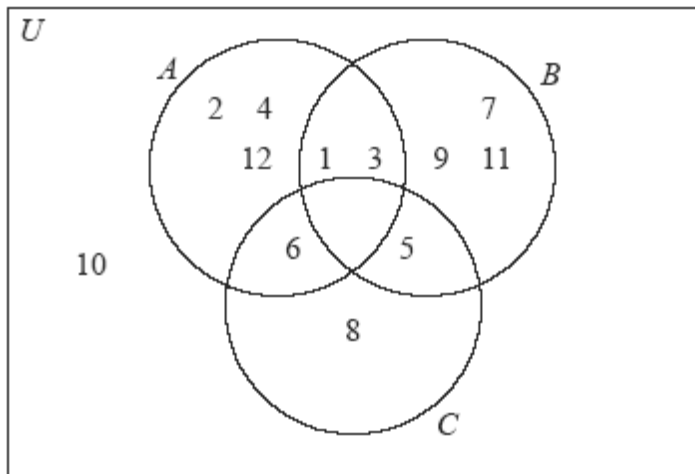
- (a) 1 (one) (A1) (C1)

Note: 6, {6} or {1} earns no marks.

- (b) 1, 3, 5, 7, 9, 11 (A1) (C1)

Note: Do not penalise if braces, parentheses or brackets are seen.

(c)



(A1)(A1)(ft)(A1)(ft)(A1)(ft) (C4)

Notes: Award (A1) for the empty set $A \cap B \cap C$.

Award (A1)(ft) for the correct placement of 6, 5, 1 and 3.

Award (A1)(ft) for the correct placement of 2, 4, 12, 7, 9, 11, 8.

Award (A1)(ft) for the correct placement of 10.

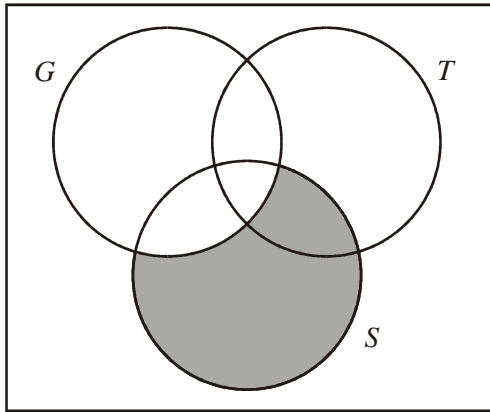
Follow through from part (b).

[6]

4.

- (a) (i) 11 (A1) (C1)
 (ii) $2 + 3 = 5$ (A1) (C1)
 (iii) $8 + 4 + 6 + 4 = 22$ (A1) (C1)

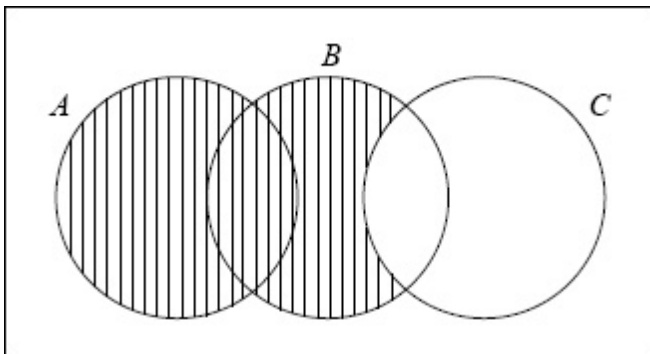
(b)



(A1) (C1)

[4]

5. (a)



not shading C or shading $A \cup B$
correct shading

(A1)

(A1) (C2)

(b) Identifying the correct 5 numbers 3, 4, 5, 6, 9
27

(A1)

(A1) (C2)

(c) (i) $M = \{3, 6, 9, 12, 15, 18\}$ brackets not required.

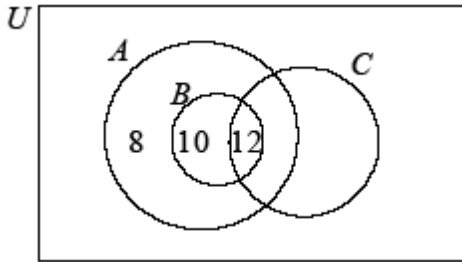
(A1)

(ii) $E' \cap M = \{3, 9, 15, 21, 27, 33\}$ (ft) from (i).

(A1)(ft) (C2)

[6]

6. (a)



(A1)(A1)(A1)

Note: Award (A1) for each correct number in the correct position.

(b) 28

(A1)(ft)

Note: 20 + their 8

(c) 59

(A1)(ft)

(d) $10 + 12 + 20 + 6$

(M1)

Note: Award (M1) for use of the correct regions.

$= 48$

(A1)(ft)(G2)

OR

$59 - 8 - 3$

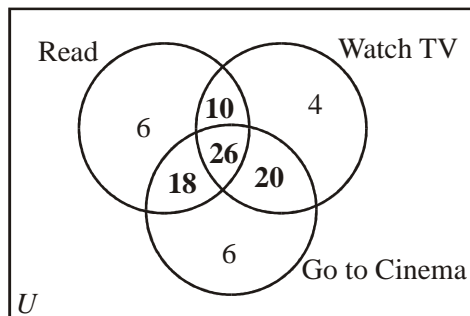
(M1)

$= 48$

(A1)(ft)

[7]

7. (a)



(A4) (C4)

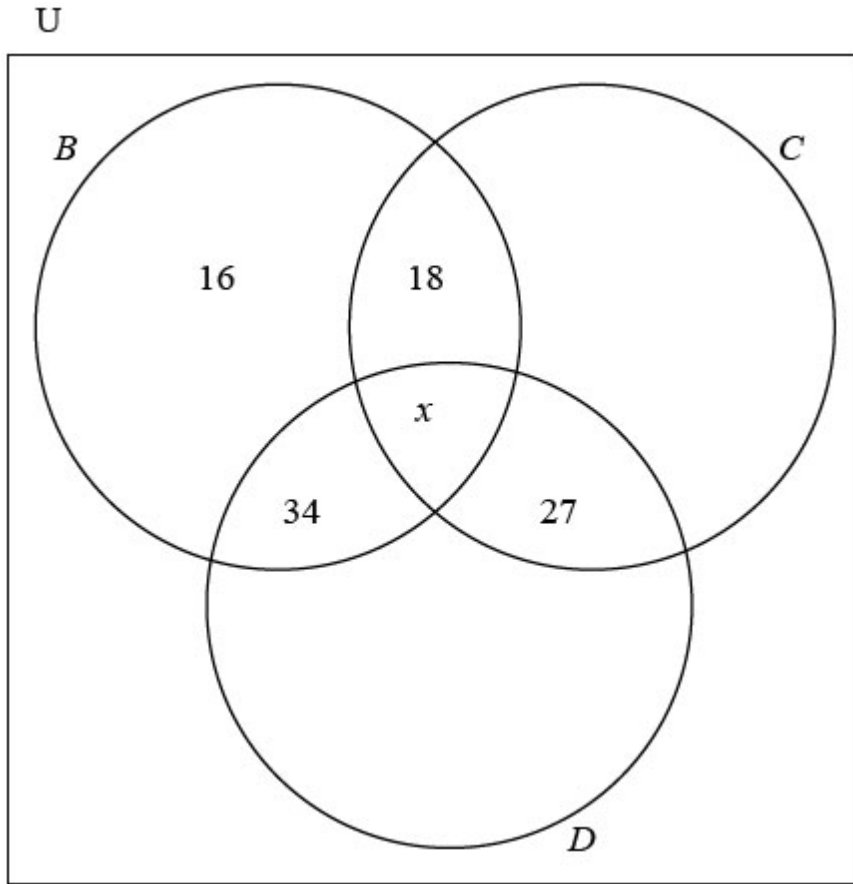
Notes: Award (A1) for Venn Diagram drawn correctly (circles and rectangle).

Award (A3) for all four correct (A2) for three correct (A1) for two correct and (A0) for one correct.

- (b) (i) $60 - (10 + 26 + 20)$ (M1)
 $= 4$ (A1)
- (ii) $70 - (18 + 26 + 20)$ (M1)
 $= 6$ (A1) (C4)

[8]

8. (a)



(A2) (C2)

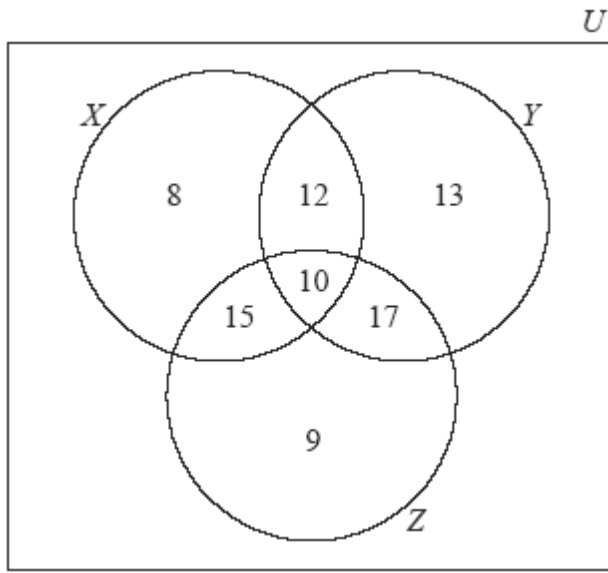
Notes: (A1) only if 1 error

(A0) otherwise

- (b) $x + 16 + 18 + 34 = 99$
 $x = 31$ (A1) (C1)
- (c) Choir only $= 88 - (18 + 27 + 31) = 12$ (A1)(ft)
Drama only $= 110 - (27 + 34 + 31) = 18$ (A1)(ft)
Total $= 16 + 34 + 18 + 31 + 12 + 27 + 18 = 156$ (A1)(ft) (C3)

[6]

9. (a)



(A1) for rectangle and three intersecting circles

(A1) for 10, (A1) for 8, 13 and 9, (A1) for 12, 15 and 17

(A4)

(b) $100 - (9 + 12 + 13 + 15 + 10 + 17 + 8) = 16$

(M1)(A1)(ft)(G2)

Note: Follow through from their diagram.

(c) $\frac{51}{100}$ (0.51)

(A1)(ft)

= 51%

(A1)(ft)(G2)

Note: Follow through from their diagram.

(d) **Note:** The following statements are correct. Please note that the connectives are important. It is not the same (had cereal) and (not bread) and (had cereal) or (not bread). The parentheses are not needed but are there to facilitate the understanding of the propositions.

(had cereal) and (did not have bread)

(had cereal only) or (had cereal and fruit only)

(had either cereal or (fruit and cereal)) and (did not have bread) (A1)(A1)

Notes: If the statements are correct but the connectives are wrong then award at most (A1)(A0).

For the statement (had only cereal) and (cereal and fruit) award (A1)(A0).

For the statement had cereal and fruit award (A0)(A0).

(e) $\frac{54}{100}$ (0.54, 54 %) (A1)(ft)(A1)(ft)(G2)

Note: Award (A1)(ft) for numerator, follow through from their diagram, (A1)(ft) for denominator. Follow through from total or denominator used in part (c).

(f) $\frac{10}{100} \times \frac{9}{99} = \frac{1}{110}$ (0.00909, 0.909%) (A1)(ft)(M1)(A1)(ft)(G2)

Notes: Award (A1)(ft) for their correct fractions, (M1) for multiplying two fractions, (A1)(ft) for their correct answer. Answer 0.009 with no working receives no marks. Follow through from denominator in parts (c) and (e) and from their diagram.

[15]