Prob with conditional MS

0 min
0 marks

1. (a) –4, –3, –2, –1, 0, 1, 2 (A1) (C1)

Note: *Award (A1) for correct numbers, do not penalise if braces, brackets or parentheses seen.*

(b) $\frac{4}{7}$ (0.571, 57.1%) (A1)(ft)(A1)(ft) (C2)

Notes: *Award (A1)(ft) for numerator, (A1)(ft) for denominator. Follow through from part (a).*

Note: *There is no further penalty in parts (c) and (d) for use of denominator consistent with that in part (b).*

(c) $\frac{1}{7}$ (0.143, 14.3%) (A1)(ft) (C1)

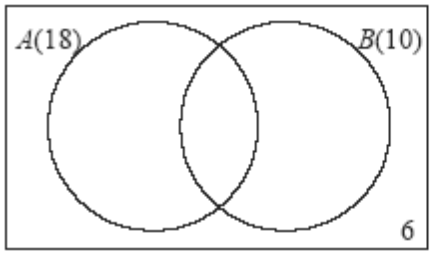
Note: *Follow through from part (a).*

(d) $\frac{1}{7}$ (0.143, 14.3%) (A1)(ft)(A1)(ft) (C2)

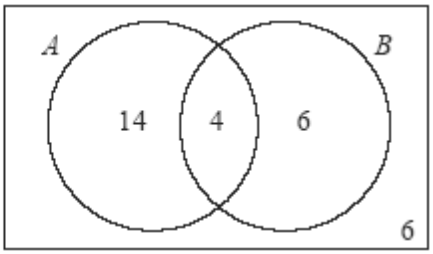
Note: *Award (A1)(ft) for numerator, (A1)(ft) for denominator. Follow through from part (a).*

[6]

2. (a)



OR



(A2) (C2)

Note: *Award (A2) for 3 correctly placed values, and no extras (4 need not be seen), (A1) for 2 correctly placed values, (A0) for 1 or no correctly placed values.*

(b) $18 + 10 + 6 - 30$ (M1)
$= 4$ (A1) (C2)

(c) $P(A \mid B) = \frac{4}{10}\left(\frac{2}{5}, 0.4, 40\%\right)$ (A1)(ft)(A1) (C2)

Note: *Award (A1)(ft) for their numerator from part (b), (A1) for denominator.*

[6]

3. (a) (i) $m = 1$ (A1)

(ii) $n = 3$ (A1) (C2)

Note: *Award (A0)(A1)(ft) for* $m = \frac{1}{8}$, $n = \frac{3}{8}$

Award (A0)(A1)(ft) for $m = 3$, $n = 1$.

(b) $P(B/R') = \frac{\frac{3}{8}}{\frac{6}{8}} = \frac{3}{6}\left(\frac{1}{2}, 50\%, 0.5\right)$ (M1)(A1)(ft) (C2)

Note: *Award (M1) for correctly substituted conditional probability formula or for 6 seen as part of denominator.*

(c) $P(B, B) = \frac{3}{8} \times \frac{3}{8} = \frac{9}{64}$ (0.141) (M1)(A1)(ft) (C2)

Note: *Award (M1) for product of two correct fractions, decimals or percentages. (ft) from their answer to part (a) (ii).*

[6]

4. (a) $0.8 = 0.5 + 0.6 - P(A \cap B)$ (M1)

$P(A \cap B) = 0.3$ (A1) (C2)

Note: *Award (M1) for correct substitution, (A1) for correct answer.*

(b) $P(A \mid B) = \frac{0.3}{0.6}$ (M1)

$= 0.5$ (A1)(ft) (C2)

Note: *Award (M1) for correct substitution in conditional probability formula. Follow through from their answer to part (a), provided probability is not greater than one.*

(c) $P(A \cap B) = P(A) \times P(B)$ or $0.3 = 0.5 \times 0.6$ (R1)

OR

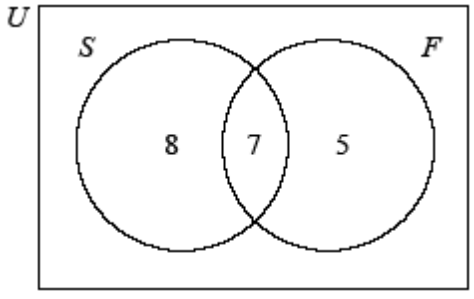
$P(A \mid B) = P(A)$ (R1)

they are independent. (Yes) (A1)(ft) (C2)

Note: *Follow through from their answers to parts (a) or (b). Do not award (R0)(A1).*

[6]

5. (a)



(A1)(A1)(A1) (C3)

Note: *Award (A1) for a labeled Venn diagram with appropriate sets.*
(A1) for 7, (A1) for 8 and 5.

(b) P (Spanish / one language only) = $\dfrac{\frac{8}{20}}{\frac{8}{20}+\frac{5}{20}}$ (M1)(A1)(ft)

Note: *Award (M1) for substituted conditional probability formula, (A1) for correct substitution. Follow through from their Venn diagram.*

= $\dfrac{8}{13}$ (0.615, 61.5%) (A1)(ft)

OR

P (Spanish / one language only) = $\dfrac{8}{8+5}$ (A1)(ft)(M1)

Note: *Award (A1) for their correct numerator, (M1) for correct recognition of regions.*
Follow through from their Venn diagram.

= $\dfrac{8}{13}$ (0.615, 61.5%) (A1)(ft) (C3)

[6]

6. (a) $a = 4$, $b = 1$ (A1)(A1) 2

(b) $30 - (4 + 12 + 1 + 2 + 4 + 4) = 3$ (M1)(A1) (or (A2)) 2

(c) $\dfrac{24}{30}\left(=\dfrac{4}{5}\right)$ (A1)(A1) 2

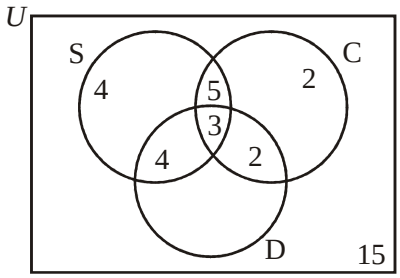
Note: *Award (A1) for numerator, (A1) for denominator.*

(d) $\dfrac{6}{19}$ (A1)(A1) 2

Note: *Award (A1) for numerator, (A1) for denominator.*

[8]

7.



(a) 3 intersecting circles and rectangle. (A1)
correct numbers (A4) 5

Note: *Award (A4) for all 7 numbers correct, (A3) for 6 correct, (A2) for 5 correct, (A1) for 4 correct.*
*(Do **not** count the number in D only on the Venn Diagram at this stage.)*

(b) $4 + 5 + 3 + 4 + 2 + 2 + 15 + x = 40$ (M1)
$35 + x = 40$
$x = 5$
Therefore, five play drums only. (A1) 2
(AG)

(c) $\frac{4}{40}\left(\frac{1}{10}, 10\%, 0.1\right)$ (A2) 2

Note: *Award (A1) for 4, (A1) for 40.*

(d) $\frac{21}{40}$ (52.5%, 0.525) (A2) 2

Note: *Award (A1) for 21, (A1) for 40.*

(e) $\frac{8}{16}\left(\frac{1}{2}, 50\%, 0.5\right)$ (A3) 3

Note: *Award (A1) for 8, (A2) for 16. Do **not** separate (A2).*

[14]