New test - November 16, 2014 *[125 marks]*

In a college 450 students were surveyed with the following results

150 have a television

205 have a computer

220 have an iPhone

75 have an iPhone and a computer

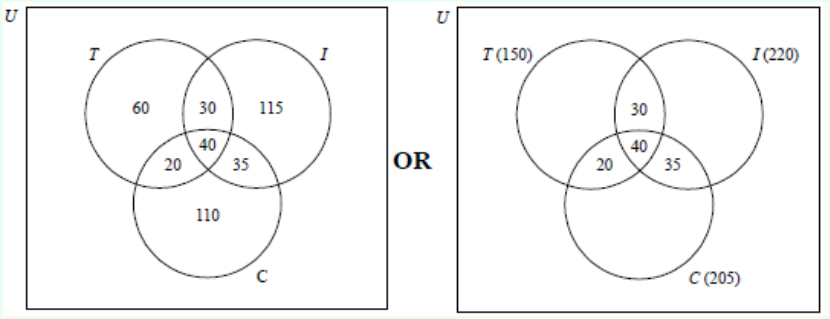
60 have a television and a computer

70 have a television and an iPhone

40 have all three.

1a. Draw a Venn diagram to show this information. Use T to represent the set of students who have a television, C the set of students who have a computer and I the set of students who have an iPhone. *[4 marks]*

Markscheme



(A1)(A1)(A1)(A1)

Notes: Award ***(A1)*** for labelled sets T, C, and I included inside an enclosed universal set. (Label U is not essential.) Award ***(A1)*** for central entry 40. ***(A1)*** for 20, 30 and 35 in the other intersecting regions. ***(A1)*** for 60, 110 and 115 or $T(150)$, $C(205)$, $I(220)$.

[4 marks]

1b. Write down the number of students that *[2 marks]*

(i) have a computer only;

(ii) have an iPhone and a computer but no television.

Markscheme

In parts (b), (c) and (d) follow through from their diagram.

(i) 110 ***(A1)*****(ft)**

(ii) 35 ***(A1)*****(ft)**

[2 marks]

1c. Write down $n[T \cap (C \cup I)']$. *[1 mark]*

Markscheme

In parts (b), (c) and (d) follow through from their diagram.

60 ***(A1)*****(ft)**

[2 marks]

1d. Calculate the number of students who have none of the three. *[2 marks]*

Markscheme

In parts (b), (c) and (d) follow through from their diagram.

$450 - (60 + 20 + 40 + 30 + 115 + 35 + 110)$ ***(M1)***

Note: Award ***(M1)*** for subtracting all their values from 450.

$= 40$ ***(A1)*****(ft)*****(G2)***

[2 marks]

1e. Two students are chosen at random from the 450 students. Calculate the probability that *[6 marks]*

(i) neither student has an iPhone;

(ii) only one of the students has an iPhone.

Markscheme

(i) $\frac{230}{450} \times \frac{229}{449}$ ***(A1)(M1)***

Note: Award ***(A1)*** for correct fractions, ***(M1)*** for multiplying their fractions.

$\frac{52670}{202050}\left(\frac{5267}{20205}, 0.261, 26.1\%\right)(0.26067...)$ ***(A1)(G2)***

Note: Follow through from their Venn diagram in part (a).

(ii) $\frac{220}{450} \times \frac{230}{449} + \frac{230}{450} \times \frac{220}{449}$ ***(A1)(A1)***

Note: Award ***(A1)*** for addition of their products, ***(A1)*** for two correct products.

OR

$\frac{230}{450} \times \frac{220}{449} \times 2$ ***(A1)(A1)***

Notes: Award ***(A1)*** for their product of two fractions multiplied by 2, ***(A1)*** for correct product of two fractions multiplied by 2. Award ***(A0)(A0)*** if correct product is seen not multiplied by 2.

$\frac{2024}{4041}(0.501, 50.1\%)(0.50086\ldots)$ ***(A1)(G2)***

Note: Follow through from their Venn diagram in part (a) and/or their 230 used in part (e)(i).

Note: For consistent use of replacement in parts (i) and (ii) award at most ***(A0)(M1)(A0)*** in part (i) and ***(A1)*****(ft)*****(A1)(A1)*****(ft)** in part (ii).

[6 marks]

$U = \{x | x \text{ is an integer}, 2 < x < 10\}$

A and B are subsets of U such that A = {multiples of 3}, B = {factors of 24}.

2a. List the elements of *[2 marks]*

(i) U ;

(ii) B .

Markscheme

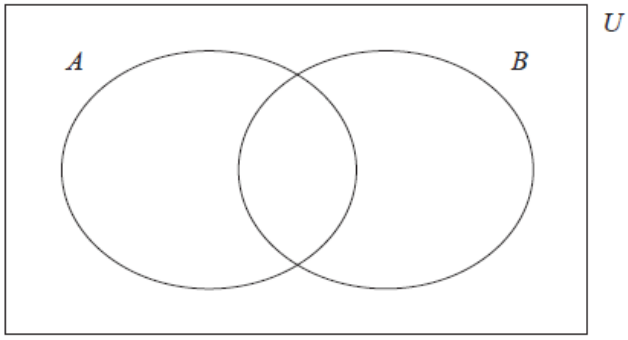
(i) 3, 4, 5, 6, 7, 8, 9 ***(A1)***

(ii) 3, 4, 6, 8 ***(A1)*(ft)** ***(C2)***

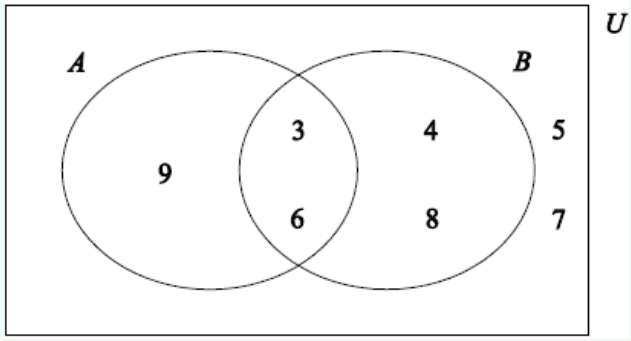
Notes: Follow through from part (a)(i).

[2 marks]

2b. Write down the elements of U on the Venn diagram. *[3 marks]*



Markscheme



***(A1)*(ft)** for their 3, 6
***(A1)*(ft)** for their 4, 8, 9
(A1)*(ft)** for their 5, 7 ***(A1)*(ft)*(A1)*(ft)*(A1)*(ft)** ***(C3)

Note: Follow through from their universal set and set B in part (a).

[3 marks]

2c. Write down $n(A \cap B)$. *[1 mark]*

Markscheme

2 *(A1)*(ft) *(C1)*

Note: Follow through from their Venn diagram.

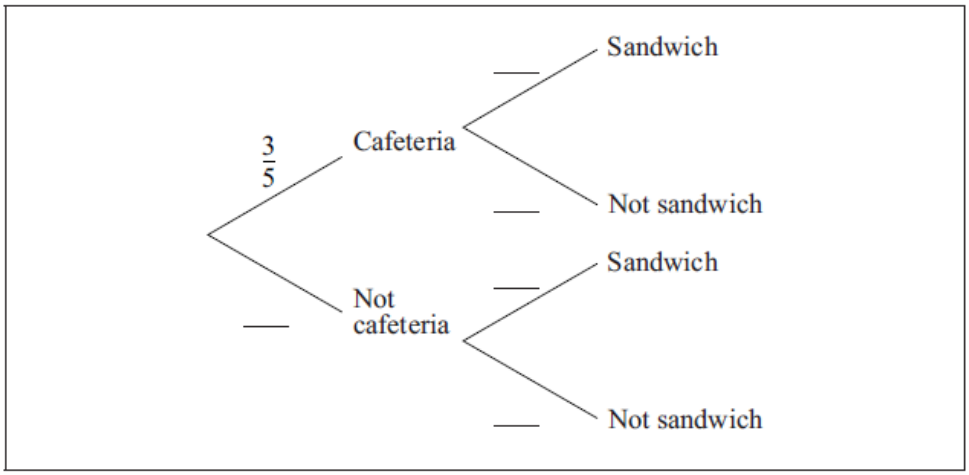
[1 mark]

The probability that Tanay eats lunch in the school cafeteria is $\frac{3}{5}$.

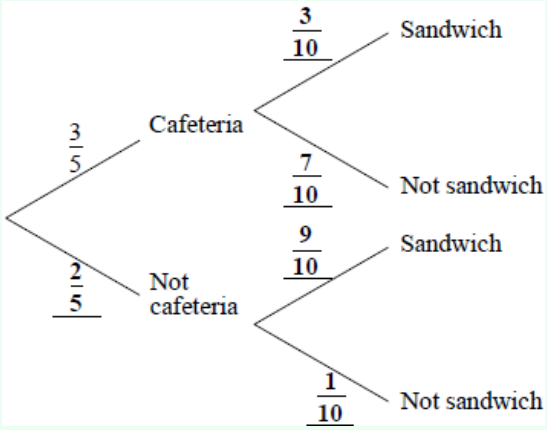
If he eats lunch in the school cafeteria, the probability that he has a sandwich is $\frac{3}{10}$.

If he does not eat lunch in the school cafeteria the probability that he has a sandwich is $\frac{9}{10}$.

3a. Complete the tree diagram below. *[3 marks]*



Markscheme



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

Note: Award *(A1)* for each correct pair of branches.

3b. Find the probability that Tanay has a sandwich for his lunch. *[3 marks]*

Markscheme

$\frac{3}{5} \times \frac{3}{10} + \frac{2}{5} \times \frac{9}{10}$ ***(A1)*****(ft)*****(M1)***

Notes: Award ***(A1)*****(ft)** for their two correct products, ***(M1)*** for addition of their products. Follow through from their tree diagram.

$= \frac{27}{50} (0.54, 54\%)$ ***(A1)*****(ft)** ***(C3)***

100 students at IB College were asked whether they study Music (M), Chemistry (C), or Economics (E) with the following results.

10 study all three

15 study Music and Chemistry

17 study Music and Economics

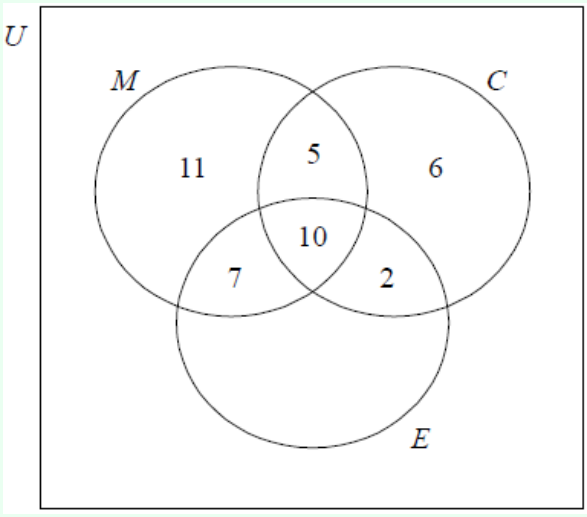
12 study Chemistry and Economics

11 study Music **only**

6 study Chemistry **only**

4a. Draw a Venn diagram to represent the information above. *[4 marks]*

Markscheme



(A1) for rectangle and three labelled circles (U need not be seen)

(A1) for 10 in the correct region

(A1) for 2, 7 and 5 in the correct regions

(A1) for 6 and 11 in the correct regions ***(A4)***

4b. Write down the number of students who study Music but not Economics. *[1 mark]*

Markscheme

16 ***(A1)*****(ft)**

Note: Follow through from their Venn diagram.

4c. There are 22 Economics students **in total**. *[4 marks]*

(i) Calculate the number of students who study Economics only.

(ii) Find the number of students who study none of these three subjects.

Markscheme

(i) $10 + 7 + 2$ ***(M1)***

Note: Award ***(M1)*** for summing their 10, 7 and 2.

$22 - 19$

$= 3$ ***(A1)*****(ft)*****(G2)***

Note: Follow through from their diagram. Award ***(M1)(A1)*****(ft)** for answers consistent with their diagram irrespective of whether working seen. Award a maximum of ***(M1)(A0)*** for a negative answer.

(ii) $22 + 11 + 5 + 6$ ***(M1)***

Note: Award ***(M1)*** for summing 22, and their 11, 5 and 6.

$100 - 44$

$= 56$ ***(A1)*****(ft)*****(G2)***

Note: Follow through from their diagram. Award ***(M1)(A1)*****(ft)** for answers consistent with their diagram **and** the use of 22 irrespective of whether working seen. If negative values are used or implied award ***(M0)(A0)***.

4d. A student is chosen at random from the 100 that were asked above. *[7 marks]*

Find the probability that this student

(i) studies Economics;

(ii) studies Music and Chemistry but not Economics;

(iii) does not study either Music or Economics;

(iv) does not study Music given that the student does not study Economics.

Markscheme

(i) $\frac{22}{100}\left(\frac{11}{50}, 0.22, 22\%\right)$ ***(A1)(G1)***

(ii) $\frac{5}{100}\left(\frac{1}{20}, 0.05, 5\%\right)$ ***(A1)*****(ft)*****(A1)(G2)***

Note: Award ***(A1)*****(ft)** for their 5 in numerator, ***(A1)*** for denominator.

Follow through from their diagram.

(iii) $\frac{62}{100}\left(\frac{31}{50}, 0.62, 62\%\right)$ ***(A1)*****(ft)*****(A1)(G2)***

Note: Award ***(A1)*****(ft)** for $100 - (22 + 11 + \text{their } 5)$, ***(A1)*** for denominator.

Follow through from their diagram.

(iv) $\frac{62}{78}\left(\frac{31}{39}, 0.795, 79.5\%\right)$ (0.794871...) ***(A1)*****(ft)*****(A1)(G2)***

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

Forty families were surveyed about the places they went to on the weekend. The places were the circus (C), the museum (M) and the park (P).

16 families went to the circus

22 families went to the museum

14 families went to the park

4 families went to all three places

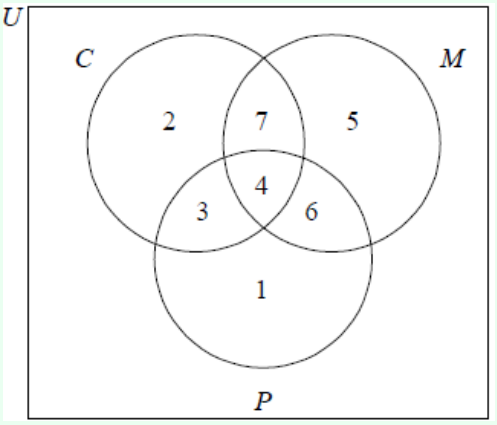
7 families went to both the circus and the museum, but not the park

3 families went to both the circus and the park, but not the museum

1 family went to the park only

5a. Draw a Venn diagram to represent the given information using sets labelled C, M and P. Complete the diagram to include the number of families represented in each region. *[4 marks]*

Markscheme



(A1)(A1)(A1)(A1)

Award ***(A1)*** for 3 intersecting circles and rectangle, ***(A1)*** for 1, 3, 4 and 7, ***(A1)*** for 2, ***(A1)*** for 6 and 5.

5b. Find the number of families who *[4 marks]*

(i) went to the circus only;

(ii) went to the museum and the park but not the circus;

(iii) did not go to any of the three places on the weekend.

Markscheme

(i) 2 ***(A1)*****(ft)**

(ii) 6 ***(A1)*****(ft)**

(iii) $40 - (1 + 6 + 2 + 3 + 4 + 7 + 5)$ ***(M1)***

Note: Award ***(M1)*** for subtracting all their values from 40.

$= 12$ ***(A1)*****(ft)*****(G2)***

Note: Follow through from their Venn diagram for parts (i), (ii) and (iii).

5c. A family is chosen at random from the group of 40 families. Find the probability that the family went to *[8 marks]*

(i) the circus;

(ii) two or more places;

(iii) the park or the circus, but not the museum;

(iv) the museum, given that they also went to the circus.

Markscheme

(i) $\frac{16}{40}\left(\frac{2}{5}, 0.4, 40\%\right)$ ***(A1)(A1)(G2)***

Note: Award ***(A1)*** for numerator, ***(A1)*** for denominator. Answer must be less than 1 otherwise award ***(A0)(A0)***. Award ***(A0)(A0)*** if answer is given as incorrect reduced fraction without working.

(ii) $\frac{20}{40}\left(\frac{1}{2}, 0.5, 50\%\right)$ ***(A1)*****(ft)** ***(A1) (G2)***

Note: Award ***(A1)*****(ft)** for numerator, ***(A1)*** for denominator. Follow through from their Venn diagram. Answer must be less than 1 otherwise award ***(A0)(A0)***. Award ***(A0)(A0)*** if answer is given as incorrect reduced fraction without working.

(iii) $\frac{6}{40}\left(\frac{3}{20}, 0.15, 15\%\right)$ ***(A1)*****(ft)*****(A1)(G2)***

Note: Award ***(A1)*****(ft)** for numerator, ***(A1)*** for denominator. Follow through from their Venn diagram. Answer must be less than 1 otherwise award ***(A0)(A0)***. Award ***(A0)(A0)*** if answer is given as incorrect reduced fraction without working.

(iv) $\frac{11}{16}\left(0.6875, 68.75\%\right)$ ***(A1)*****(ft)*****(A1)(G2)***

Note: Award ***(A1)*****(ft)** for numerator, ***(A1)*** for denominator. Follow through from their Venn diagram. Answer must be less than 1 otherwise award ***(A0)(A0)***. Award ***(A0)(A0)*** if answer is given as incorrect reduced fraction without working.

5d. Two families are chosen at random from the group of 40 families. *[3 marks]*

Find the probability that both families went to the circus.

Markscheme

$\frac{16}{40} \times \frac{15}{39}$ ***(A1)(A1)*****(ft)**

Note: Award ***(A1)*** for multiplication of their probabilities, ***(A1)*****(ft)** for their correct probabilities.

$\frac{240}{1560}\left(\frac{2}{13}, 0.153846..., 15.4\%\right)$ ***(A1)*****(ft)*****(G2)***

Note: Follow through from their answer to part (c)(i). Answer must be less than 1 otherwise award at most ***(A1)(A1)(A0)*****(ft)**.

Alan's laundry basket contains two green, three red and seven black socks. He selects one sock from the laundry basket at random.

6a. Write down the probability that the sock is red. *[1 mark]*

Markscheme

$\frac{3}{12}\left(\frac{1}{4}, 0.25, 25\%\right)$ ***(A1)*** ***(C1)***

6b. Alan returns the sock to the laundry basket and selects two socks at random. *[2 marks]*

Find the probability that the first sock he selects is green and the second sock is black.

Markscheme

$\left(\frac{2}{12}\right) \times \left(\frac{7}{11}\right)$ *(M1)*

Note: Award *(M1)* for correct product.

$= \frac{14}{132}\ \left(\frac{7}{66}, 0.10606..., 10.6\%\right)$ *(A1)* *(C2)*

6c. Alan returns the socks to the laundry basket and again selects two socks at random. *[3 marks]*

Find the probability that he selects two socks of the same colour.

Markscheme

$\left(\frac{2}{12} \times \frac{1}{11}\right) + \left(\frac{3}{12} \times \frac{2}{11}\right) + \left(\frac{7}{12} \times \frac{6}{11}\right)$ *(M1)(M1)*

Note: Award *(M1)* for addition of their 3 products, *(M1)* for 3 correct products.

$= \frac{50}{132}\ \left(\frac{25}{66}, 0.37878..., 37.9\%\right)$ *(A1)* *(C3)*

A store recorded their sales of televisions during the 2010 football World Cup. They looked at the numbers of televisions bought by gender and the size of the television screens.

This information is shown in the table below; S represents the size of the television screen in inches.

	$S \leq 22$	$22 < S \leq 32$	$32 < S \leq 46$	$S > 46$	Total
Female	65	100	40	15	220
Male	20	65	140	55	280
Total	85	165	180	70	500

The store wants to use this information to predict the probability of selling these sizes of televisions for the 2014 football World Cup.

7. Use the table to find the probability that *[6 marks]*

(i) a television will be bought by a female;

(ii) a television with a screen size of $32 < S \leq 46$ will be bought;

(iii) a television with a screen size of $32 < S \leq 46$ will be bought by a female;

(iv) a television with a screen size greater than 46 inches will be bought, given that it is bought by a male.

Markscheme

(i) $\frac{220}{500}\left(\frac{11}{25}, 0.44, 44\%\right)$ ***(A1)(G1)***

(ii) $\frac{180}{500}\left(\frac{9}{25}, 0.36, 36\%\right)$ ***(A1)(G1)***

(iii) $\frac{40}{500}\left(\frac{2}{25}, 0.08, 8\%\right)$ ***(A1)(A1)(G2)***

(iv) $\frac{55}{500}\left(\frac{11}{56}, 0.196, 19.6\%\right)$ ***(A1)(A1)(G2)***

Note: Award ***(A1)*** for numerator, ***(A1)*** for denominator. Award ***(A0)(A0)*** if answers are given as incorrect reduced fractions without working.

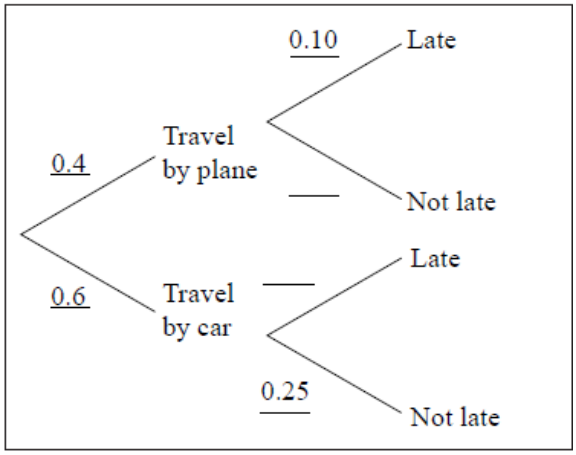
[6 marks]

Merryn plans to travel to a concert tomorrow. Due to bad weather, there is a 60 % chance that all flights will be cancelled tomorrow. If the flights are cancelled Merryn will travel by car.

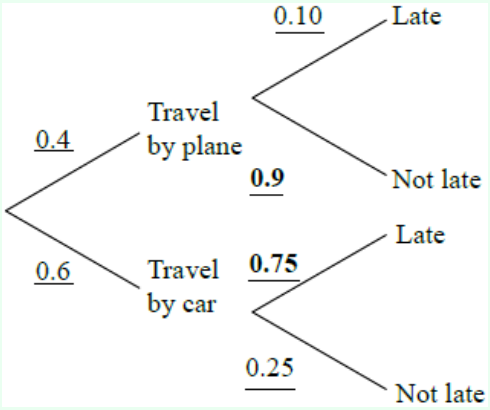
If she travels by plane the probability that she **will be late** for the concert is 10 %.

If she travels by car, the probability that she **will not be late** for the concert is 25 %.

8a. Complete the tree diagram below. *[1 mark]*



Markscheme



(A1) *(C1)*

Note: Award *(A1)* for 0.9 and 0.75.

[1 mark]

8b. Find the probability that Merryn will not be late for the concert. *[3 marks]*

Markscheme

$0.4 \times 0.9 + 0.6 \times 0.25$ ***(M1)(M1)***

Note: Award *(M1)* for their two relevant products, *(M1)* for adding their two products.

$0.51 \left(\frac{51}{100}, 51\%\right)$ ***(A1)*****(ft)** ***(C3)***

Note: Follow through from their answers to part (a).

[3 marks]

8c. Merryn was not late for the concert the next day. *[2 marks]*

Given that, find the probability that she travelled to the concert by car.

Markscheme

$\frac{0.6 \times 0.25}{0.51}$ ***(M1)***

Note: Award *(M1)* for correctly substituted conditional probability formula.

$0.294 \left(\frac{5}{17}, 0.294117...\right)$ ***(A1)*****(ft)** ***(C2)***

Note: Follow through from their tree diagram and their part (b).

[2 marks]

Beartown has three local newspapers: *The Art Journal*, *The Beartown News*, and *The Currier*.

A survey shows that

32 % of the town's population read *The Art Journal*,

46 % read *The Beartown News*,

54 % read *The Currier*,

3 % read *The Art Journal* and *The Beartown News* **only**,

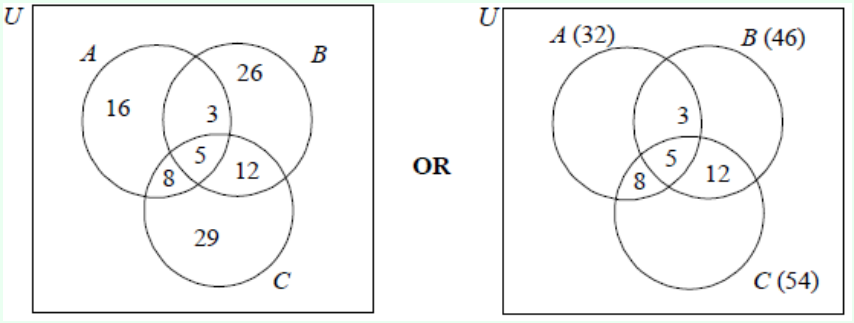
8 % read *The Art Journal* and *The Currier* **only**,

12 % read *The Beartown News* and *The Currier* **only**, and

5 % of the population reads **all** three newspapers.

9a. Draw a Venn diagram to represent this information. Label *A* the set that represents *The Art Journal* readers, *B* the set that represents *The Beartown News* readers, and *C* the set that represents *The Currier* readers. *[4 marks]*

Markscheme



(A1) for three circles and a rectangle (*U* need not be seen)

(A1) for 5

(A1) for 3, 8 and 12

(A1) for 16, 26 and 29 **OR** 32, 46, 54 placed outside the circles. ***(A4)***

Note: Accept answers given as decimals or fractions.

[4 marks]

9b. Find the percentage of the population that does not read any of the three newspapers. *[2 marks]*

Markscheme

$100 - (16 + 26 + 29) - (8 + 5 + 3 + 12)$ ***(M1)***

$100 - 71 - 28$

Note: Award ***(M1)*** for correct expression. Accept equivalent expressions, for example $100 - 71 - 28$ or $100 - (71 + 28)$.

$= 1$ ***(A1)*****(ft)*****(G2)***

Note: Follow through from their Venn diagram but only if working is seen.

[2 marks]

9c. Find the percentage of the population that reads exactly one newspaper. *[2 marks]*

Markscheme

16 + 26 + 29 *(M1)*

Note: Award *(M1)* for 16, 26, 29 seen.

= 71 *(A1)*(ft)*(G2)*

Note: Follow through from their Venn diagram but only if working is seen.

[2 marks]

9d. Find the percentage of the population that reads *The Art Journal* or *The Beartown News* but not *The Currier*. *[2 marks]*

Markscheme

16 + 3 + 26 *(M1)*

Note: Award *(M1)* for their 16, 3, 26 seen.

= 45 *(A1)*(ft)*(G2)*

Note: Follow through from their Venn diagram but only if working is seen.

[2 marks]

9e. A local radio station states that 83 % of the population reads either *The Beartown News* or *The Currier*. *[2 marks]*

Use your Venn diagram to decide whether the statement is true. Justify your answer.

Markscheme

True *(A1)*(ft)

100 – (1 –16) = 83 *(R1)*(ft)

OR

46 + 54 – 17 = 83 *(R1)*(ft)

Note: Do not award *(A1)(R0)*. Follow through from their Venn diagram.

[2 marks]

The seniors from Gulf High School are required to participate in exactly one after-school sport. Data were gathered from a sample of 120 students regarding their choice of sport. The following data were recorded.

	Sport			
Gender	**Football**	**Tennis**	**Basketball**	**Total**
Male	17	8	10	35
Female	31	17	37	85
Total	48	25	47	120

A χ^2 test was carried out at the 5 % significance level to analyse the relationship between gender and choice of after-school sport.

10a. One student is chosen at random from the 120 students. *[2 marks]*

Find the probability that this student

(i) is male;

(ii) plays tennis.

Markscheme

(i) $\frac{35}{120}\left(\frac{7}{24}, 0.292, 29.2\%\right)$ (0.291666...) ***(A1)***

(ii) $\frac{25}{120}\left(\frac{5}{24}, 0.208, 20.8\%\right)$ (0.208333...) ***(A1)***

[2 marks]

10b. Two students are chosen at random from the 120 students. *[5 marks]*

Find the probability that

(i) both play football;

(ii) neither play basketball.

Markscheme

(i) $\frac{48}{120} \times \frac{47}{119}$ ***(A1)(M1)***

Note: Award ***(A1)*** for two correct fractions, ***(M1)*** for multiplying their two fractions.

$= \frac{94}{595}(0.158, 15.8\%)$ (0.157983...) ***(A1)(G2)***

(ii) $\frac{73}{120} \times \frac{72}{119}$ ***(M1)***

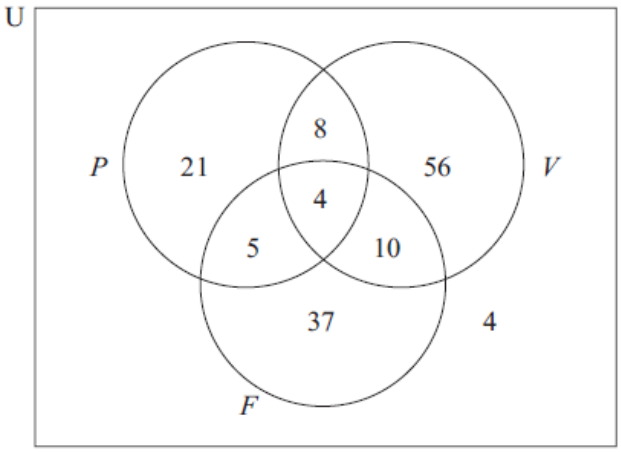
Note: Award ***(M1)*** for multiplying correct fractions. If sampling with replacement has been used in both parts (h)(i) and (h)(ii) do not penalise in part (h)(ii). Award a maximum of ***(M1)(A1)*****(ft)**.

$= \frac{219}{595}(0.368, 36.8\%)$ (0.368067...) ***(A1)(G2)***

[5 marks]

Music lessons in Piano (P), Violin (V) and Flute (F) are offered to students at a school.

The Venn diagram shows the number of students who learn each kind of instrument.



11a. Write down the total number of students in the school. *[1 mark]*

Markscheme

145 *(A1)* *(C1)*

[1 mark]

11b. Write down the number of students who *[3 marks]*

(i) learn violin only;

(ii) learn piano or flute or both;

(iii) do not learn flute.

Markscheme

(i) 56 *(A1)*

(ii) 85 *(A1)*

(iii) 89 *(A1)* *(C3)*

[3 marks]

11c. Explain, in words, the meaning of the part of the diagram that represents the set $P \cap F'$. *[2 marks]*

Markscheme

The students who learn the piano and do not learn the flute. *(A1)(A1)* *(C2)*

Notes: Award *(A1)* for students who learn piano, not flute, *(A1)* for and (accept but). Accept correct alternative statements. Accept "The number of students who learn the piano and do not learn the flute".

[2 marks]

Leanne goes fishing at her favourite pond. The pond contains four different types of fish: bream, flathead, whiting and salmon. The fish are either undersized or normal. This information is shown in the table below.

Size / Type of fish	Bream	Flathead	Whiting	Salmon	Total
Undersized	3	12	18	9	42
Normal	0	11	24	13	48
Total	3	23	42	22	

12a. Leanne catches a fish. *[7 marks]*

Find the probability that she

(i) catches an undersized bream;

(ii) catches either a flathead or an undersized fish or both;

(iii) does not catch an undersized whiting;

(iv) catches a whiting given that the fish was normal.

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(i) $\frac{3}{90}$ $(0.0\bar{3},\ 0.0333,\ 0.0333...,\ 3.\bar{3}\%,\ 3.33\%)$ ***(A1)*****(ft)**

Note: For the denominator follow through from their answer in part (a).

(ii) $\frac{53}{90}$ $(0.5\bar{8},\ 0.588...,\ 0.589,\ 58.\bar{8}\%,\ 58.9\%)$ ***(A1)(A1)*****(ft)*****(G2)***

Notes: Award ***(A1)*** for the numerator. ***(A1)*****(ft)** for denominator. For the denominator follow through from their answer in part (a).

(iii) $\frac{72}{90}$ $(0.8,\ 80\%)$ ***(A1)*****(ft)*****(A1)*****(ft)*****(G2)***

Notes: Award ***(A1)*****(ft)** for the numerator, (their part (a) –18) ***(A1)*****(ft)** for denominator. For the denominator follow through from their answer in part (a).

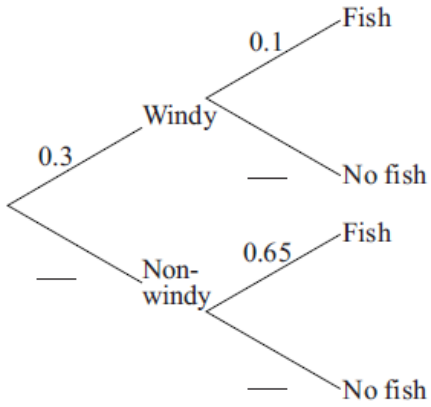
(iv) $\frac{24}{48}$ $(0.5,\ 50\%)$ ***(A1)(A1)(G2)***

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

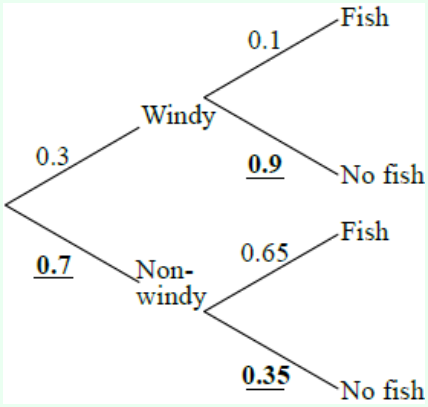
[7 marks]

12b. Leanne notices that on windy days, the probability she catches a fish is 0.1 while on non-windy days the probability she catches a fish is 0.65. The probability that it will be windy on a particular day is 0.3. *[3 marks]*

Copy and complete the probability tree diagram below.



Markscheme



(A1)(A1)(A1)

Notes: Award ***(A1)*** for each correct entry. Tree diagram must be seen for marks to be awarded.

[3 marks]

12c. Leanne notices that on windy days, the probability she catches a fish is 0.1 while on non-windy days the probability she catches a fish is 0.65. The probability that it will be windy on a particular day is 0.3. *[2 marks]*

Calculate the probability that it is windy and Leanne catches a fish on a particular day.

Markscheme

$0.3 \times 0.1 = 0.03 \left(\frac{3}{100}\right)$ ***(M1)(A1)(G2)***

Note: Award ***(M1)*** for correct product seen.

[2 marks]

12d. Leanne notices that on windy days, the probability she catches a fish is 0.1 while on non-windy days the probability she catches a fish is 0.65. The probability that it will be windy on a particular day is 0.3. *[3 marks]*

Calculate the probability that Leanne catches a fish on a particular day.

Markscheme

$0.3 \times 0.1 + 0.7 \times 0.65$ ***(M1)(M1)***

Notes: Award ***(M1)*** for 0.7×0.65 (or 0.455) seen, ***(M1)*** for adding their 0.03. Follow through from their answers to parts (c) and (d).

$= 0.485 \left(\frac{485}{1000}, \frac{97}{200}\right)$ ***(A1)*****(ft)*****(G2)***

Note: Follow through from their tree diagram and their answer to part (d).

[3 marks]

12e. Use your answer to part (e) to calculate the probability that Leanne catches a fish on two consecutive days. *[2 marks]*

Markscheme

0.485×0.485 ***(M1)***

$0.235 \left(\frac{9409}{40000}, 0.235225\right)$ ***(A1)*****(ft)*****(G2)***

Note: Follow through from their answer to part (e).

[2 marks]

12f. Leanne notices that on windy days, the probability she catches a fish is 0.1 while on non-windy days the probability she catches a fish is 0.65. The probability that it will be windy on a particular day is 0.3. *[3 marks]*

Given that Leanne catches a fish on a particular day, calculate the probability that the day was windy.

Markscheme

$\frac{0.03}{0.485}$ ***(M1)(A1)*****(ft)**

Notes: Award ***(M1)*** for substituted conditional probability formula, ***(A1)*****(ft)** for their (d) as numerator and their (e) as denominator.

$0.0619 \left(\frac{6}{97}, 0.0618556...\right)$ ***(A1)*****(ft)*****(G2)***

Note: Follow through from their parts (d) and (e).

[3 marks]

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