Unit 1 Revision Sheet F Probability Venn Diagrams and Handling Data Foundation & Higher

Questions

Q1.

Abid is waiting for a bus.
The probability that his bus will be early is 0.2
The probability that his bus will be on time is 0.7
Work out the probability that his bus will be either early or on time.

.....

(Total for question = 2 marks)

Q2.

A box contains four different kinds of chocolates.
Debbie takes at random a chocolate from the box.
The table shows the probability of Debbie taking an Orange or a Coffee or a Caramel chocolate.

Chocolate	Probability
Orange	0.15
Coffee	0.40
Caramel	0.35
Strawberry	

(a) Work out the probability that Debbie takes a Strawberry chocolate.

.....
(2)

(b) Work out the probability that Debbie takes an Orange chocolate or a Coffee chocolate.

.....
(2)

(Total for question = 4 marks)

Q3.

Steve throws a 6-sided dice.
The dice can land on 1 or on 2 or on 3 or on 4 or on 5 or on 6

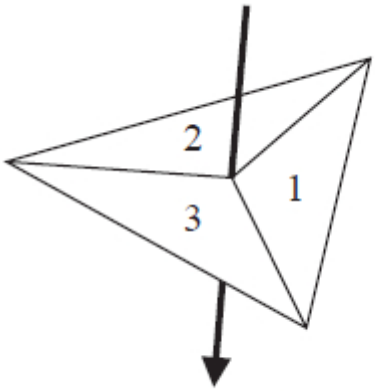
He also spins a coin.
The coin can land on heads (H) or on tails (T).

List all the possible combinations he could get.

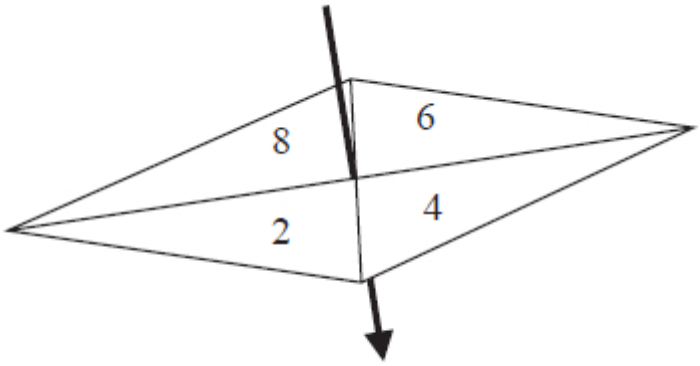
(Total for question = 2 marks)

Q4.

Hanako has two fair spinners.
Spinner A is 3-sided and can land on 1, 2 or 3
Spinner B is 4-sided and can land on 2, 4, 6 or 8



Spinner **A**



Spinner **B**

Hanako spins each spinner once.

She adds together the number that spinner **A** lands on and the number that spinner **B** lands on to get her total score.

(a) Complete the table to show all possible total scores.

Four total scores have been done for you.

Spinner B \ Spinner A	1	2	3
2	3		
4		6	
6		8	9
8			

(2)

(b) Find the probability that

(i) Hanako's total score is 8

.....

(ii) Hanako's total score is less than 7

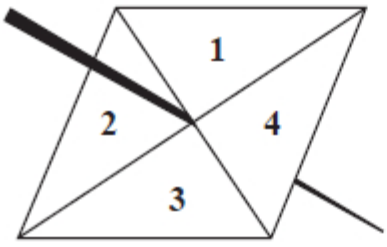
.....

(2)

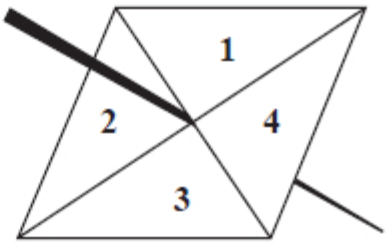
(Total for question = 4 marks)

Q5.

Here are two fair spinners.



Spinner **A**



Spinner **B**

Shola spins each spinner once.

The score is the sum of the number spinner **A** lands on and the number spinner **B** lands on.

(a) Complete the table to show the possible scores.

Spinner B / Spinner A	1	2	3	4
1				
2				6
3		5		
4			7	

(2)

(b) Find the probability that the score will be 3 or less.

.....

(2)

(c) Find the probability that the number spinner **A** lands on will be greater than the number spinner **B** lands on.

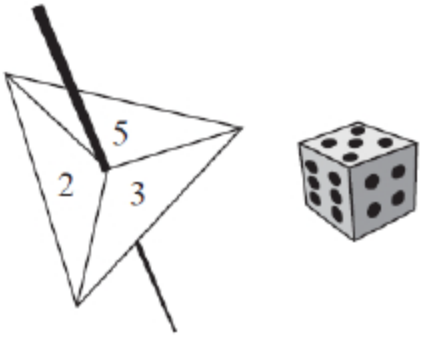
.....

(2)

(Total for question = 6 marks)

Q6.

Paul has a fair 3-sided spinner and a fair 6-sided dice.



The spinner can land on 2, 3 or 5.

Paul spins the spinner once and throws the dice once.

(a) Complete the table to show all the possible outcomes.

Four outcomes have been done for you.

		Dice					
		1	**2**	**3**	**4**	**5**	**6**
Spinner	**2**	2,1					2,6
	3			3,3	3,4		
	5						

(2)

Paul spins the spinner once and throws the dice once.

(b) Find the probability that the number the spinner lands on is greater than the number shown on the dice.

.....

(2)

(Total for question = 4 marks)

Q7.

There are some counters in a bag.

7 of the counters are blue.
5 of the counters are green.
The rest of the counters are yellow.

One counter is going to be taken at random from the bag.

The probability that the counter is blue or is green is $\frac{6}{13}$

Work out how many yellow counters there are in the bag.

.....

(Total for question = 3 marks)

Q8.

The table shows information about the grades some Year 9 students gained in a biology test and in a physics test. The highest grade is **A** and the lowest grade is **D**.

Physics \ Biology	A	B	C	D
A	8	6	2	1
B	3	5	4	0
C	4	2	6	2
D	0	0	5	0

(a) How many students gained a grade **C** in biology?

.....

(2)

(b) How many students gained the same grade in biology as they gained in physics?

.....

(2)

(c) How many students gained a higher grade in biology than they gained in physics?

.....

(2)

(Total for question = 6 marks)

Q9.

Becky has a biased 6-sided dice.

The table gives information about the probability that, when the dice is thrown, it will land on each number.

Number	1	2	3	4	5	6
Probability	$2x$	0.18	$2x$	$3x$	0.26	x

Becky is going to throw the dice 200 times.

Work out an estimate for the number of times that the dice will land on an even number.

.....

(Total for question = 4 marks)

Q10.

Toy cars are made in a factory.
The toy cars are made for 15 hours each day.
5 toy cars are made every 12 seconds.

For the toy cars made each day, the probability of a toy car being faulty is 0.002

Work out an estimate of the number of faulty toy cars that are made each day.

.....

(Total for question = 4 marks)

Q11.

At a school fete, Colin is selling drinks.
He sells tea, coffee and juice.
Marion is selling food.
She sells burgers and pizzas.

Jenson buys one drink and one food item.

(a) Write down all the possible combinations Jenson can buy.

.....

.....

.....

(2)

Each burger costs £1.65
Each pizza costs £3.10

Caroline buys 3 burgers and 4 pizzas.

She pays with a £20 note.

(b) Work out how much change she should get.

£ .....

(3)

(Total for question = 5 marks)

Q12.

At a coffee morning, Mairi is selling drinks.
She sells coffee and tea.
Mairi is also selling cakes.
She sells brownies, doughnuts and flapjacks.

Frankie buys one drink and one cake.

Write down all the possible combinations Frankie can buy.

.....

.....

.....

(Total for question = 2 marks)

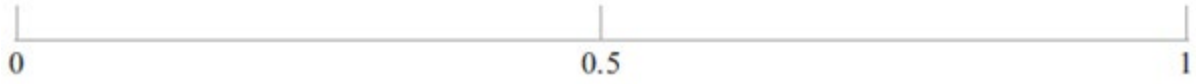
Q13.

On the probability scale, mark with a cross (×) the probability that

(i) the last letter of a day of the week, chosen at random, is the letter *y*.
Label this cross **A**.

(ii) a person chosen at random has a birthday in June.
Label this cross **B**.

(iii) the next baby born is a girl.
Label this cross **C**.



(Total for question = 3 marks)

Q14.

Sarah has a biased 4-sided spinner.
The spinner can land on 1, 2, 3 or 4

The probability that the spinner will land on 1, 2 or 4 is given in the table.

Number	1	2	3	4
Probability	0.4	0.35		0.1

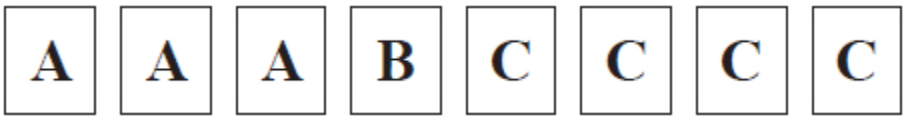
Work out the probability that the spinner will land on 3

.....

(Total for question = 2 marks)

Q15.

Here are 8 cards.
Each card has a letter on it.



Malik takes at random one of these cards.

impossible	unlikely	evens	likely	certain

(a) Write down the word from the box that best describes the likelihood that Malik takes

(i) a card with the letter **B**,

.....

(ii) a card with the letter **D**.

.....

(2)

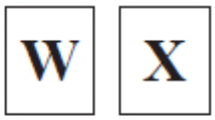
(b) Find the probability that Malik takes a card with the letter **A**.

.....

(2)

Sunil has two sets of cards, Set 1 and Set 2
Each card has a letter on it.

Set 1



Set 2

Sunil takes one card from Set 1
He then takes one card from Set 2

(c) List all the possible combinations of cards he could get.

.....

.....

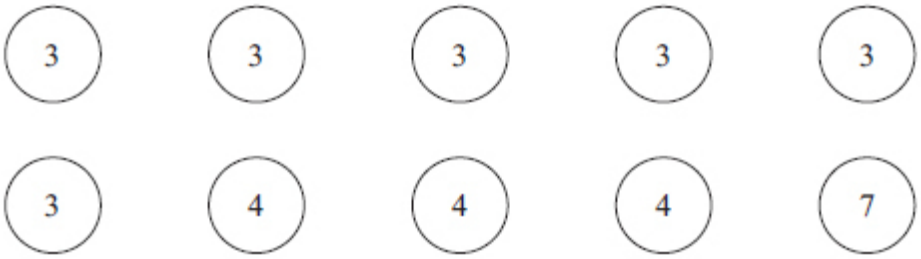
.....

(2)

(Total for question = 6 marks)

Q16.

Here are ten counters.
Each counter has a number on it.



Fern puts the ten counters in a bag.
She takes at random a counter from the bag.

(a) Find the probability that the number on the counter is 7

.....

(1)

(b) Find the probability that the number on the counter is less than 8

.....

(1)

(c) Find the probability that the number on the counter is an odd number.

.....

(2)

(d) Find the probability that the number on the counter is 3 or 4

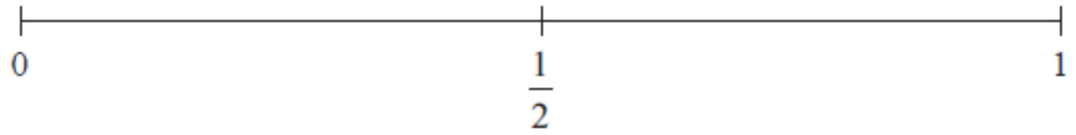
.....

(2)

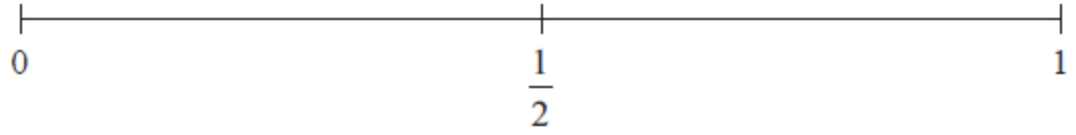
(Total for question = 6 marks)

Q17.

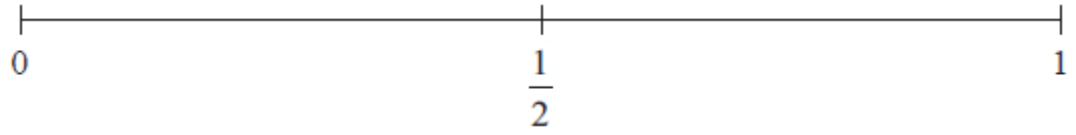
(i) On the probability scale, mark with a cross (×) the probability that when a fair coin is thrown once it will land Heads.



(ii) On the probability scale, mark with a cross (×) the probability that when an ordinary fair dice is thrown once it will land on 7



(iii) On the probability scale, mark with a cross (×) the probability that when an ordinary fair dice is thrown once it will land on 6



(Total for question = 3 marks)

Q18.

impossible	unlikely	likely	certain

(a) Write down a word from the box that best describes the likelihood of each outcome.

(i) In a week chosen at random, Wednesday will be after Tuesday.

.....

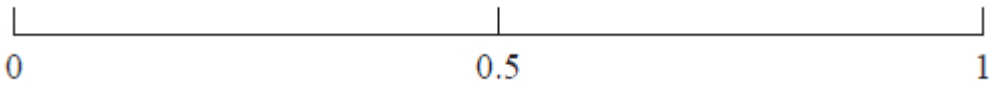
(ii) A person chosen at random will have a birthday in August.

.....

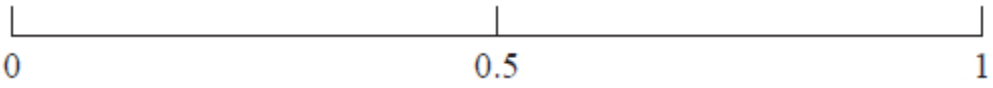
(2)

(b) James throws an ordinary fair dice.

(i) On the probability scale, mark with a cross (×) the probability that the dice will land on a number greater than 6



(ii) On the probability scale, mark with a cross (×) the probability that the dice will land on an even number.



(2)

(Total for question = 4 marks)

Q19.

impossible	unlikely	evens	likely	certain

(a) Write down a word from the box that best describes the likelihood of each outcome.

(i) A person chosen at random will have their birthday on 29 February.

.....

(ii) The next baby born will be a girl.

.....

(2)

In a fridge, there are

4 strawberry yoghurts
2 peach yoghurts
5 cherry yoghurts
1 banana yoghurt

Sarah takes at random one of these yoghurts.

(b) Write down the probability that she takes

(i) a banana yoghurt,

.....

(ii) a strawberry yoghurt or a cherry yoghurt,

.....

(iii) a raspberry yoghurt.

.....

(3)

(Total for question = 5 marks)

Q20.

The two-way table shows some information about the 60 noodle meals eaten in a noodle bar by each of 60 people last Friday.

Type of noodle

	Ramen	Soba	Udon	Total
Boiled	18			31
Fried		12	7	
Total			15	60

(a) Complete the two-way table.

(3)

One of the 60 people is selected at random.

(b) Write down the probability that this person ate Fried Udon noodles.

.....

(1)

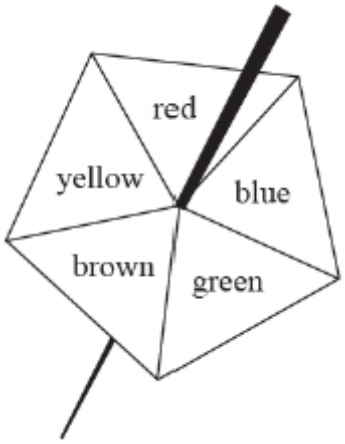
(Total for question = 4 marks)

Q21.

Write your answers in the spaces provided.

You must write down all the stages in your working.

Here is a biased 5-sided spinner.



Kenny spins the spinner once.
The table gives the probabilities that the spinner lands on red or on blue or on green.

Colour	red	blue	green	brown	yellow
Probability	0.15	0.26	0.33		

(a) Work out the probability that the spinner lands on red or blue.

(1)

When the spinner is spun once, the probability that the spinner lands on brown is 0.06 more than the probability that the spinner lands on yellow.

Jenine spins the spinner 150 times.

(b) Work out an estimate for the number of times the spinner lands on yellow

(4)

(Total for question = 5 marks)

Mark Scheme

Q1.

Q	Working	Answer	Mark	Notes
	0.2 + 0.7		2	M1
		0.9 oe		A1 oe inc $\frac{9}{10}$, 90%
				Total 2 marks

Q2.

Question Number	Working	Answer	Mark	Notes
(a)	1 – (0.15 + 0.4 + 0.35)	0.1	2	M1 A1
(b)	0.15 + 0.4	0.55	2	M1 A1
				Total 4 marks

Q3.

Question	Working	Answer	Mark	Notes
		1H, 1T, 2H, 2T, 3H, 3T, 4H, 4T, 5H, 5T, 6H, 6T	2	B2 for all 12 combinations and no extras or repeats If not B2 then B1 for at least 4 correct combinations (ignoring repeats)

Q4.

Q		Working	Answer	Mark	Notes	
	(a)	<table><tr><td></td><td>**1**</td><td>**2**</td><td>**3**</td></tr><tr><td>**2**</td><td>3</td><td>***4***</td><td>***5***</td></tr><tr><td>**4**</td><td>***5***</td><td>6</td><td>***7***</td></tr><tr><td>**6**</td><td>***7***</td><td>8</td><td>9</td></tr><tr><td>**8**</td><td>***9***</td><td>***10***</td><td>***11***</td></tr></table>	Correctly completed table	2	M1 A1	3 -7 correct entries All 8 entries correct
	(b)(i)		$\frac{1}{12}$	1	B1oe	ft from fully completed table (0.083(33..))
	(ii)		$\frac{5}{12}$	1	B1oe	ft from fully completed table (0.416(66...))
						Total 4 marks

Q5.

Ques	Working	Answer	Mark	Notes
a	<table><tr><td>B / A</td><td>**1**</td><td>**2**</td><td>**3**</td><td>**4**</td></tr><tr><td>**1**</td><td>**2**</td><td>**3**</td><td>**4**</td><td>5</td></tr><tr><td>**2**</td><td>**3**</td><td>**4**</td><td>5</td><td>6</td></tr><tr><td>**3**</td><td>**4**</td><td>5</td><td>6</td><td>7</td></tr><tr><td>**4**</td><td>5</td><td>6</td><td>7</td><td>8</td></tr></table>	Correct table	2	B2 fully correct table (B1 6 or more correct entries)
b			2	M1 for $\frac{n}{16}$ with $0 < n < 16$ or for $\frac{3}{m}$ with $m > 3$
		$\frac{3}{16}$ oe		A1
c			2	M1 all 6 cases identified (condone 1 error)
		$\frac{6}{16}$ oe		A1
				Total 6 marks

Q6.

Question	Working	Answer	Mark	Notes
(a)	**(2,1)** (2,2) (2,3) (2,4) (2,5) **(2,6)** (3,1) (3,2) **(3,3)** **(3,4)** (3,5) (3,6) (5,1) (5,2) (5,3) (5,4) (5,5) (5,6)		2	B2 All 12 correct If not B2 then B1 for 1 correct row
(b)		7/18	2	B2 If not B2 then B1 for: • $x/18$ where x is an integer greater than 0 and less than 18 or • $7/y$ where y is an integer and greater than 7
				Total 4 marks

Q7.

Q	Working	Answer	Mark	Notes
	eg $7 + 5 = 12$ **and** $\frac{6}{13} = \frac{12}{26}$ **or** 26 **or** eg $\frac{7+5}{7+5+x} = \frac{6}{13}$ **and** $13(7+5) = 6(7+5+x)$		3	M1 for method to find the total number of counters
	eg $26 - 12$ **or** eg $6x = 84$			M1 complete method to find the number of yellow counters **or** a correct equation with x terms isolated
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	14		A1 cao
				Total 3 marks

Q8.

Question	Working	Answer	Mark	Notes
(a)	2 + 4 + 6 + 5		2	M1
		17		A1
(b)	8 + 5 + 6		2	M1
		19		A1
(c)	3 + 4 + 2 + 5		2	M1
		14		A1 If no marks awarded, SC B1 for 6 + 4 + 2 + 2 + 1 (=15)
				Total 6 marks

Q9.

Question		Working	Answer	Mark	Notes
		$2x + 0.18 + 2x + 3x + 0.26 + x = 1$ **or** $1 - (0.18 + 0.26)$ (= 0.56)			M1
		$x = (1 - 0.18 - 0.26) \div (2 + 2 + 3 + 1)$ (=0.07)			M1
		(0.18 + 4 ×"0.07") × 200 **or** 0.46 × 200 **or** 36 + 42 + 14 oe			M1 dep on M2 **and** probabilities between 0 and 1 **or** for $\frac{92}{200}$, oe with 92 seen
			92	4	A1
					Total 4 marks

Q10.

Q	Working	Answer	Mark	Notes	
	$15 \times 60 \times 60$ (= 54 000) oe **or** $\frac{60}{12} \times 60 \times 15$ (= 4500) oe **or** $5 \times \frac{60}{12} \times 60$ (= 1500) oe		4	M1	M2 for $\frac{15 \times 60 \times 60 \times 5}{12}$ (= 22 500)
	'54000' ÷ 12 × 5 (= 22 500) oe **or** '4500' × 5 (= 22 500) oe **or** '1500' × 15 (=22 500) oe			M1	
	'22 500' × 0.002 oe			M1	dep on M2 for a complete method
		45		A1	
					Total 4 marks

Q11.

Question	Working	Answer	Mark	Notes
(a)			2	M1 For at least 3 correct combinations or for all correct with repeats
		TB, TP, CB, CP, JB, JP		A1 All correct and no repeats
(b)	3 × 1.65 (=4.95) **or** 4 × 3.10 (=12.40) **or** 17.35		3	M1
	20 – 3 × 1.65 – 4 × 3.10 oe			M1 allow 20 – a × 1.65 – b × 3.10 oe where a and b are both either 3 or 4
		2.65		A1 accept £2.65p
				Total 5 marks

Q12.

Q		Working	Answer	Mark	Notes	
			CB, CD, CF TB, TD, TF	2	M1 A1	For at least 3 correct combinations or for all correct with repeats All correct and no repeats
						Total 2 marks

Q13.

Question	Working	Answer	Mark	Notes
(i)	Mark A	Mark A at 1	1	B1
(ii)	Mark B	B Mark B at 0.8 cm to 3 cm from O	1	B1
(iii)	Mark C	Mark C at 0.5	1	B1
				Total 3 marks

Q14.

Question	Working	Answer	Mark	Notes
	$1 - (0.4 + 0.35 + 0.1)$			M1
		0.15	2	A1
				Total 2 marks

Q15.

Question	Working	Answer	Mark	Notes
ai		unlikely	1	B1
aii		impossible	1	B1
b		$\frac{3}{8}$	2	M1 for $\frac{a}{8}$ with $a < 8$ or $\frac{3}{b}$ with $b > 3$ A1
c		E,W E,X F,W F,X G,W G,X	2	M1 for at least 3 correct pairs (ignore repeats) A1 for all 6 pairs with no repeats
				Total 6 marks

Q16.

Question Number	Working	Answer	Mark	Notes	
(a)		$\frac{1}{10}$	1	B1	Penalise only first occurrence of incorrect notation.
(b)		1	1	B1 Accept $\frac{10}{10}$ or $\frac{1}{1}$	
(c)		$\frac{7}{10}$	2	M1 for fraction with a denominator of 10 A1 for $\frac{7}{10}$	
(d)		$\frac{6}{10} + \frac{3}{10}$ oe	2	M1	
		$\frac{9}{10}$		A1	
					Total 6 marks

Q17.

Ques		Working	Answer	Mark	Notes
	i		X at $\frac{1}{2}$ on scale	1	B1
	ii		X at 0 on scale	1	B1
	iii		X to the right of 0 and to the left of 0.25 on scale	1	B1
					Total 3 marks

Q18.

Q	Working	Answer	Mark	Notes
(a) (i)		Certain	1	B1
(ii)		Unlikely	1	B1
(b) (i)		Cross at 0	1	B1
(ii)		Cross at 0.5	1	B1
				Total 4 marks

Q19.

Q	Working	Answer	Mark	Notes
(a)(i)		unlikely	1	B1 cao
(a)(ii)		evens	1	B1 cao
(b) (i)		$\frac{1}{12}$	1	B1 or 0.083(3…)
(b) (ii)		$\frac{9}{12}$	1	B1oe $\frac{3}{4}$ or 0.75 or 75%
(b) (iii)		0	1	B1oe **NB**. Penalise incorrect notation once only in (b) by deducting one mark
				Total 5 marks

Q20.

Q	Working	Answer	Mark	Notes
(a)	<table><tr><th></th><th>ramen</th><th>soba</th><th>udon</th><th>Total</th></tr><tr><td>Boiled</td><td>18</td><td><u>5</u></td><td><u>8</u></td><td>31</td></tr><tr><td>Fried</td><td><u>10</u></td><td>12</td><td>7</td><td><u>29</u></td></tr><tr><td>Total</td><td><u>28</u></td><td><u>17</u></td><td>15</td><td>60</td></tr></table>	Correct table	3	B3 All 6 correct entries (B2 4 or 5 correct entries B1 2 or 3 correct entries)
(b)		$\frac{7}{60}$	1	B1 accept 0.11666... (accept 2 d.p. or better truncated or rounded) or 11.666...% (accept 2 s.f. or better truncated or rounded)
				Total 4 marks

Q21.

Question	Working	Answer	Mark	Notes
(a)	$0.15+0.26$	0.41 oe	1	B1
(b)	$1-(0.15+0.26+0.33)$ **or** $1-0.74\ (=0.26)$			M1 can be implied by two values where P(brown) + P(yellow) = 0.26 (may be seen in table)
	$(\text{P(yellow)}=)\ \frac{"0.26"-0.06}{2}$ **or** 0.1			M1 for a complete method to find P(yellow)
	$150\times"0.1"$			M1 independent mark Award for $150 \times p$ where $0 < p < 1$
		15	4	A1 NB: An answer of $\frac{15}{150}$ scores M3 A0