



Countdown to your final Maths exam ...

Crossover part 1 (2020)

Markscheme & Examiners Report

Examiners Reports

- Q1. A familiar question to students, and one where a larger percentage of students were able to score full marks for a correct prime factor decomposition, either using index form or not. When full marks were not scored many gained one mark for a correct partial method.
- Q2. Most students approached this question by adding 9 minutes many times to 6.45 and then 12 minutes on to 6.45. There were many arithmetic errors found when using this approach. Those that were able to do this accurately tended to get the correct answer of 7.21 am. Very few students approached this by trying to find the LCM of 9 and 12.
- Q3. Students appeared well-prepared to answer this best value question with over a quarter able to employ a proportional method to reach a fully correct conclusion with supporting evidence. The majority of those who gained full marks calculated the cost per tea bag and where students lost marks for this method it was generally down to premature rounding. Students who calculated quantity per unit price were generally less successful and were on the whole unable to correctly interpret their results, in many cases mistakenly thinking they had calculated price per tea bag. Several students successfully gained one mark through scaling to 125 bags for the small box, but this method did not generally produce a correct overall conclusion.
- Q4. This question was well attempted, with many gaining full marks for correctly interpreting the question and showing the ability to calculate the missing values and place them in the frequency tree correctly. Of those who were not awarded full marks, the vast majority were able to correctly place at least one of the given values, and then able to calculate at least 1 or 2 of the missing values. However, these were often located in the incorrect place in the frequency tree, showing a lack of understanding of what those missing values actually represented or an inability to re-read the question and check where to put the individual answers. The most common numerical mistakes tended to be made on the last branch for males, for example a common incorrect answer was to divide 22 by 2. 23 and 18 were the most common 'calculated value' seen. Students preferred not to show any working out and most of the time the answers in the frequency tree were not backed up by calculations, provided the values given were correct this wasn't a problem. A minority of students completed the frequency tree with probabilities rather than frequencies.
- Q5. It was very pleasing to see that the vast majority of students approached this question by using a two-way table. As a result it was very well done with majority of students gaining full marks. For those students who did not use a table some responses were difficult to follow, with numbers and calculations containing no written explanation as to the category or gender. Some students showed good practice by checking their final solution with the given information.
- Q6. No Examiner's Report available for this question
- Q7. The most common approach was to create a factor tree. Many candidates opted to start with 8 and 7 and then correctly completed this approach. Poor arithmetic stopped some candidates from gaining full credit, but they were able to pick up a method mark for completing their tree to prime

number ends provided there was only one error. Many candidates were able to express the prime numbers as a product, but some lost the final mark by writing the prime factors as a list. Some candidates chose to use index notation to tidy up their final answer; this was not required to score full marks and any errors in doing this were not penalised.

Q8. This question was not done well. Those students opting to present the information in a two-way table had considerably more success than those who did not. Students presenting their answers in a two-way table should be advised to show the details of their calculations. Those students not opting to present the information in a two-way table were often very untidy in the presentation, with calculations appearing all over the working space. Although many students were not able to score full marks on this question many were able to score at least one mark for a correct first stage in their calculations, usually for 54 (total number of bottles on Sunday), and sometimes for 48 (total number of half pint bottles).

MarkScheme.

1		2x2x3x3	2	M1 for complete method to find prime factors A1 for 2x2x3x3																				
2		7.21 am	3	M1 for listing multiples of 9 and 12. M1 for identifying 36 as LCM A1 for 7:21 am																				
3		<p><u>Examples:</u> <u>£ per bag:</u> $2.15 \div 50 = 0.043$ $3.30 \div 80 = 0.04125$ $5.18 \div 125 = 0.04144$ <u>Bags per £:</u> $50 \div 2.15 = 23.25..$ $80 \div 3.30 = 24.24$ $125 \div 5.18 = 21.131...$</p> <p>Medium</p>	4	M1 for division of price by quantity for at least 2 boxes or division of quantity by amount for at least 2 boxes. M1 for complete method for all 3 boxes. A1 for correct values for all 3 boxes C1 for correct conclusion																				
4		<p style="text-align: center;">4 22 18 22 38 16</p>	3	M1 for at least one piece of information placed correctly from 22 or 16. M1 for another piece of information placed correctly. A1 for fully correct tree,																				
5		<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>S</th> <th>A</th> <th>B</th> <th>Total</th> </tr> </thead> <tbody> <tr> <th>F</th> <td style="text-align: center;">6</td> <td style="text-align: center;">11</td> <td style="text-align: center;">26</td> <td style="text-align: center;">43</td> </tr> <tr> <th>M</th> <td style="text-align: center;">4</td> <td style="text-align: center;">9</td> <td style="text-align: center;">10</td> <td style="text-align: center;">23</td> </tr> <tr> <th>Total</th> <td style="text-align: center;">10</td> <td style="text-align: center;">20</td> <td style="text-align: center;">36</td> <td style="text-align: center;">66</td> </tr> </tbody> </table>		S	A	B	Total	F	6	11	26	43	M	4	9	10	23	Total	10	20	36	66	4	M1 for correct first step which results in a value that could be in the table. M1 for second value. M1 for a fully correct and complete method A1 cao
	S	A	B	Total																				
F	6	11	26	43																				
M	4	9	10	23																				
Total	10	20	36	66																				
6	a	$20 \times 500 = 10000$ $10000 - 7000$	3	P1 evidence of estimation i.e. 20 or 500 used.																				

		3000		P1 complete process to solve the problem A1																				
	b	Underestimate	1	C1 ft eg overestimate as both numbers rounded up.																				
7		$2 \times 2 \times 2 \times 7$	2	M1 for complete method to find prime factors A1 for $2 \times 2 \times 2 \times 7$																				
8		<table border="1"> <thead> <tr> <th></th> <th>$\frac{1}{2}$</th> <th>1</th> <th>2</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Sat</td> <td>31</td> <td>16</td> <td>7</td> <td>54</td> </tr> <tr> <td>Sun</td> <td>17</td> <td>14</td> <td>15</td> <td>46</td> </tr> <tr> <td>Total</td> <td>48</td> <td>30</td> <td>22</td> <td>100</td> </tr> </tbody> </table> <p>14 1 pint bottles sold on Sunday</p>		$\frac{1}{2}$	1	2	Total	Sat	31	16	7	54	Sun	17	14	15	46	Total	48	30	22	100	4	M1 for 1 value calculated correctly. M1 for 2 nd value calculated correctly. M1 for fully correct method A1 cao
	$\frac{1}{2}$	1	2	Total																				
Sat	31	16	7	54																				
Sun	17	14	15	46																				
Total	48	30	22	100																				