



Countdown to your final Maths exam ...

Crossover part 5 (2020)

Markscheme & Examiners Report

Examiners Reports

- Q1.** A well answered question to start, where the only common error was a misplaced decimal point eg 0.7 or 0.007
- Q2.** A good proportion of students were able to make a start on part (a) of this question by writing the area of the rectangle as 24 and the area of the triangle as 6 and then go on to explain that $\frac{6}{24}$ was equivalent to $\frac{1}{4}$. Most students fell down when they tried to explain that four of the shaded triangles made up the rectangle having failed to realise there were only two of this sized triangle in the rectangle. They seemed to assume that dividing the rectangle using the two diagonals produced 4 congruent triangles. Part (b) was usually correct.
- Q3.** Generally a well answered question. Those who had success normally worked through equivalent fractions such as $\frac{8}{10}$ or $\frac{80}{100}$ to achieve the correct answer. Most wrong answers, such as 90, 75, 20, came with no working.
- Q4.** A significant number of students failed to understand the nature of this problem, but still gained some marks if their working out was shown, for example by using the ratio 1:9 correctly. There was some confusion between orange squash and orange drink, which might have led to the most common error where students worked with $750 \div 200$, which is filling cups directly with orange squash, rather than orange drink. There was much evidence of poor arithmetical processing in this question, suggesting students did not always have a calculator.
- Q5.** A good proportion of the students were able to add the two fractions correctly. The majority of those who attempted to use a suitable common denominator were successful although some made errors when writing the fractions to a common denominator. Many students, however, did not appreciate the need for a common denominator and the most common incorrect answer was $\frac{6}{12}$, from adding the numerators and adding the denominators.
- Q6.** This question was well understood and well answered by almost all students. Almost all students gained at least one mark in (a) usually for not giving their correct ratio in its simplest form in (a) and in (b) for establishing that the cost of the white tiles was £96 and the blue tiles was £64. A common wrong answer in (b) was £150 (the total cost of all the tiles).
- Q7.** This question was not well done with less than one in five candidates scoring any marks. The question was often either not attempted or an incorrect answer appeared on the answer line without any working shown in the space provided. Many candidates could not deal with or ignored the whole number parts in their calculations. Candidates working with decimals were given credit provided they carried out their working with sufficient accuracy. Many candidates lost marks here because they rounded prematurely. It is perhaps surprising to report that few candidates seemed to use a calculator to help them to complete the question or to check their answers.
- Q8.** Division by a ratio is traditionally poorly done, and this was no exception. Division of 2, 3, 7 separately into 60 was the most common incorrect response, along with incomplete trial and improvement methods. But candidates rarely demonstrated little understanding of what was actually needed in terms

of mathematical process. Failure to attempt the question was also not uncommon.

Q9. The most popular approach when answering this question was to find a quarter of 480 and subtract it from 480; relatively few candidates multiplied their quarter of 480 by 3. Many candidates, having divided 480 by 4, did not then go on to subtract their answer from 480. A common incorrect answer was 120.

Q10. This question was not answered as well as might have been expected. Most commonly, candidates began by working out $\frac{1}{10}$ of 700 as 70 and then attempted to work out $\frac{1}{5}$ of 700. Many candidates did this by finding half of 70 and ' $\frac{1}{5}$ of 700 = 35' was a very common error. Candidates did usually go on to add the number of 16-year olds to the number of 18-year olds and subtract the total from 700. Those who decided to work with fractions could often add $\frac{1}{10}$ and $\frac{1}{5}$ to get House style fraction and then subtract this from 1. Many candidates who used this approach, however, then gave $\frac{7}{10}$ as the final answer although the question asked **how many** of the students are 17 years old.

Q11. This question was found challenging as it was not making the common demand of sharing an amount in a given ratio. There were three successful strategies used. Firstly, some candidates turned it into a problem they were more used to and looked for a number which when shared in the ration 2:5 gave a difference of 45. As they had calculators this could be done fairly quickly. Secondly, some candidates started with the ratio 2:5 and built up through 4:10, 6:15 and so on until they reached 30:75. Thirdly, some candidates carried out the most efficient method of dividing 45 by 3 and then multiplying the resulting value by 2. Many candidates treated the question as a 'divide in the ratio' and scored no marks. Others gave an answer of 18 obtained from $45 \div 5 \times 2$.

Q12. Most students got the correct answer for part (a). Those that did not mostly scored 1 mark for 20:15 but then failed to simplify this correctly. Students found part (b) a more challenging task with many incorrect answers such as $x - y$ or $x - 20 + y - 15$.

Q13. This question on ratio was poorly understood with few students realising that the counters in the ratio of 1 : 5 is equivalent to writing the fractions $\frac{1}{6} : \frac{5}{6}$.

Students found parts (b) and (c) even more difficult as they failed to understand that the 20 counters given were yellow and not the total number of counters in the bag. Partial compensation was given in (c) for those students that realised that the answers to parts (b) and (c) should add to 10.

Mark Scheme

Q1.

Question	Working	Answer	Mark	Notes
		0.07	B1	cao

Q2.

PAPER: IMA0/IF				
Question	Working	Answer	Mark	Notes
(a)		Correct explanation	2	M1 for working out area of triangle (=6) and area of rectangle (=24) or for dividing rectangle into eighths or other comparable areas A1 for explaining that that $24 \div 6$ is 4 or $\frac{2}{8} = \frac{1}{4}$ or that $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ from symmetry of shape
(b)		75	1	B1 cao

Q3.

Question	Working	Answer	Mark	Notes
		80	B1	cao

Q4.

Paper_5MB1F_01				
Question	Working	Answer	Mark	Notes
*		4	4	<p>M1 for $200 \div (1 + 9) (= 20)$ M1 for $750 \div 20 (= 37.5)$ A1 for $3.7(3\dots)$ or $3\frac{11}{15}$ or 2800 and 3000 C1 ft (dep on M1) for clear statement of 4 bottles with working shown</p> <p>OR M1 for $750 \times 10 (= 7500)$ M1 for $200 \times 140 (= 28\ 000)$ A1 for $3.7(3\dots)$ or $3\frac{11}{15}$ or 2800 and 3000 C1 ft (dep on M1) for clear statement of 4 bottles with working shown</p> <p>OR M1 for $200 \times 140 (= 28\ 000)$ M1 for $28\ 000 \div (9 + 1) (= 2800)$ A1 for $3.7(3\dots)$ or $3\frac{11}{15}$ or 2800 and 3000 C1 ft (dep on M1) for clear statement of 4 bottles with working shown</p> <p>OR M1 for $200 \div (1 + 9) (= 20)$ M1 for $140 \times "20" (= 2800)$ A1 for $3.7(3\dots)$ or $3\frac{11}{15}$ or 2800 and 3000 C1 ft (dep on M1) for clear statement of 4 bottles with working shown</p>

Q5.

PAPER: 5MB2F_01				
Question	Working	Answer	Mark	Notes
		$\frac{8}{9}$	2	<p>M1 for using a suitable common denominator with at least one of two fractions correct A1 for $\frac{8}{9}$ or equivalent fraction</p>

Q6.

5MB1F/01 June 2015				
Question	Working	Answer	Mark	Notes
(a)		3:1	2	<p>M1 for $48 : 16$ or $24 : 8$ or $12 : 4$ or $6 : 2$ or $1 : 3$ A1 cao</p>
(b)		3:2	2	<p>M1 for $48 \times 2 (= 96)$ or $16 \times 4 (=64)$ or answer given as $2 : 3$ oe A1 for $3 : 2$ oe or M1 for "3" $\times 2$ or 6 stated and "1" $\times 4$ or 4 stated or answer given as $2 : 3$ oe A1 for $3 : 2$ oe</p>

Q7.

Question	Working	Answer	Mark	Notes
	$10\frac{1}{3} \div 19\frac{1}{4} = 10\frac{1}{3} \times \frac{4}{19}$ OR $3.33... \div 4.75$	$\frac{40}{57}$ or 0.70175(4386...)	2	M1 for $10\frac{1}{3}$ oe and $19\frac{1}{4}$ oe or 3.33(...) and 4.75 or $40 \div 57$ or 0.7, 0.70, 0.701, 0.702, 0.7017, 0.7018 A1 for $\frac{40}{57}$ oe or 0.70175(4386...)

Q8.

Question	Working	Answer	Mark	Notes
	$60 \div 12 = 5$ $2 \times 5 = 10; 3 \times 5 = 15;$ $7 \times 5 = 35$	10 15 35	3	M1 for $60 \div (2+3+7)$ or $\times 5$ or multiple build-up (at least 4 correct) eg 2:3:7, 4:6:14, 6:12:28, 8:12:28 M1 for $60 \div (2+3+7) \times 2$ or $60 \div (2+3+7) \times 3$ or $60 \div (2+3+7) \times 7$ or sight of the numbers 10, 15, 35 together or 2×5 or 3×5 or 7×5 A1 cao SC: B1 for 2 correct numbers out of 3 in a ratio

Q9.

Working	Answer	Mark	Notes
	360	3	M1 for $480 \div 4 (=120)$ oe M1 for $480 - '120'$ A1 cao OR M1 for $480 \div 4 (=120)$ oe M1 for $'120' \times 3 (=360)$ A1 cao

Q10.

Working	Answer	Mark	Notes
	490	4	M1 for $\frac{1}{10} \times 700 (= 70)$ M1 for $\frac{1}{5} \times 700 (= 140)$ M1 (dep on M1) for $700 - ("70" + "140")$ A1 cao OR M1 for $\frac{1}{10} + \frac{1}{5}$ or $\frac{3}{10}$ oe M1 for $1 - \frac{3}{10}$ or $\frac{7}{10}$ or $\frac{3}{10} \times 700$ or 210 M1 (dep on M1) for $\frac{7}{10} \times 700$ or $700 -$ "210" A1 cao

Q11.

Question	Working	Answer	Mark	Notes																																																																
	$45 \div (5 - 2) (=15)$ $'15' \times 2$ OR $45 \times \frac{2}{3}$ OR <table border="1"> <thead> <tr> <th>P</th> <th>J</th> <th>T</th> <th>D</th> </tr> </thead> <tbody> <tr><td>2</td><td>5</td><td>7</td><td>3</td></tr> <tr><td>4</td><td>10</td><td>14</td><td>6</td></tr> <tr><td>6</td><td>15</td><td>21</td><td>9</td></tr> <tr><td>8</td><td>20</td><td>28</td><td>12</td></tr> <tr><td>10</td><td>25</td><td>35</td><td>15</td></tr> <tr><td>12</td><td>30</td><td>42</td><td>18</td></tr> <tr><td>14</td><td>35</td><td>49</td><td>21</td></tr> <tr><td>16</td><td>40</td><td>56</td><td>24</td></tr> <tr><td>18</td><td>45</td><td>63</td><td>27</td></tr> <tr><td>20</td><td>50</td><td>70</td><td>30</td></tr> <tr><td>22</td><td>55</td><td>77</td><td>33</td></tr> <tr><td>24</td><td>60</td><td>84</td><td>36</td></tr> <tr><td>26</td><td>65</td><td>91</td><td>39</td></tr> <tr><td>28</td><td>70</td><td>98</td><td>42</td></tr> <tr><td>30</td><td>75</td><td>105</td><td>45</td></tr> </tbody> </table>	P	J	T	D	2	5	7	3	4	10	14	6	6	15	21	9	8	20	28	12	10	25	35	15	12	30	42	18	14	35	49	21	16	40	56	24	18	45	63	27	20	50	70	30	22	55	77	33	24	60	84	36	26	65	91	39	28	70	98	42	30	75	105	45	30	3	M1 for $45 \div (5 - 2)$ M1 for $'15' \times 2$ A1 cao for 30 OR M2 for $45 \times \frac{2}{3}$ oe (M1 for $45 \times \frac{1}{3}$) A1 cao for 30 OR M1 for (2, 5); 4, 10; 6, 15; 8, 20 M1 for a completely correct list up to 30, 75 A1 cao (SC If M0 then B1 for 18 given as the answer)
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Q12.

PAPER: 5MB1F_01

Question	Working	Answer	Mark	Notes
(a)		4 : 3	2	M1 for 20 : 15 or 3 : 4 A1 cao
(b)		$35 - x - y$	2	M1 for $20 - x$ or $15 - y$ A1 for $20 - x + 15 - y$ oe

Q13.

PAPER: IMA0/IF				
Question	Working	Answer	Mark	Notes
(a)		$\frac{1}{6}$	1	B1 cao
(b)		4	2	M1 for $20 \div 5 (=4)$ Allow build up method to 4 lots of 1:5 A1 cao
(c)		6	2	M1 for a full method to find the number of red counters needed eg $20 \div 2 = "4"$ A1 ft from (b)