



# COUNTDOWN TO YOUR FINAL MATHS EXAM ... PART 4 (2018)

## EXAMINERS REPORT & MARKSCHEME

## Mark Scheme

Q1.

	Working	Answer	Mark	Notes
*		Yes + supporting work	4	<p>M1 for adding the weights of all the ingredients (= 96)  M1 (dep) for '96' × 8  A1 cao for 768  C1 (dep on M2), ft for a correct conclusion (yes or no) from a comparison of 750 (pots) with their '768' pots; units must be quoted  [SC: B1 for 768 seen without working if M0M0 scored]  <b>OR</b>  M1 for adding the weights of all the ingredients (= 96)  M1 for 750 ÷ 8  A1 cao for 93.75  C1(dep on M2), ft for a correct conclusion (yes or no) from a comparison of their weight of ingredients in one tank full '93.75' kg with '96' kg; units must be quoted  [SC: B1 for 93.75 seen without working if M0M0 scored]]  <b>OR</b>  M1 for adding the weights of all the ingredients (= 96)  M1 (dep) for 750 ÷ '96'  A1 cao for 7.8125  C1(dep on M2), ft for a correct conclusion (yes or no) from a comparison of their number of pots, '7.8125' pots with 8 (pots); units must be quoted  [SC: B1 for 7.8125 seen without working if M0M0 scored]]</p>

Q2.

	Working	Answer	Mark	Notes
(a)(i)		12.978(61279...)	2	B1 for 12.978(.....)
(ii)		13		B1 for 13 or ft from a(i) [Note: An answer of 13.0 gets B0]
(b)		100000	1	B1 cao

Q3.

	Working	Answer	Mark	Notes
		$2.52 \times 10^{15}$	2	M1 for $4.032 \times 10^9$ or 4 032 000 000 or sight of figures 252 A1 for $2.52 \times 10^{15}$

Q4.

PAPER: 5MB3H_01				
Question	Working	Answer	Mark	Notes
		40	2	M1 for $32 \div 20$ (= 1.6) or $32 \times 25$ (= 800) or 20:25 (or use of) A1 cao

Q5.

Paper: 5MB3H_01				
Question	Working	Answer	Mark	Notes
(a)		0.0045	1	B1 cao
(b)		$6.58 \times 10^{-6}$	2	M1 for $(2.5 \div 3.8) \times 10^{(-2-3)}$ or $0.657... \times 10^{-5}$ or 0.00000657.. A1 for an answer in the range $6.57 \times 10^{-6}$ to $6.58 \times 10^{-6}$

**Q6.**

5MB1F/01 June 2015				
Question	Working	Answer	Mark	Notes
(a)		3:1	2	M1 for $48 : 16$ or $24 : 8$ or $12 : 4$ or $6 : 2$ or $1 : 3$ A1 cao
(b)		3:2	2	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

**Q7.**

PAPER: 5MB3F_01				
Question	Working	Answer	Mark	Notes
(a)		1.7	1	B1 cao
(b)		56.96	1	B1 cao
(c)		19.683	1	B1 cao

**Q8.**

Question	Working	Answer	Mark	Notes
*	$120 \div 15$ $120 + 8$ $3 \times 42$	No + correct statement	4	M1 for $120 \div 15 (=8)$ or $1 \times 8$ (teachers) to $15 \times 8$ (students) oe M1 for $42 \times 3 (=126)$ M1 for $120 + '120 \div 15'$ ( $=128$ ) or difference of 2 oe C1 (dep on all three Ms) for 126 and 128 or 'difference of 2' oe AND for a correct statement that uses correct values  <b>OR</b> M1 for $120 \div 15 (=8)$ or $1 \times 8$ (teachers) to $15 \times 8$ (students) oe M1 for $120 + '120 \div 15'$ ( $=128$ ) M1 for $(120 + '8') \div 3 (=42.66\dots)$ C1 (dep on all three Ms) for answer in range 42.6–42.7 AND for a correct statement that uses correct values  <b>OR</b> M1 for $120 \div 15 (=8)$ or $1 \times 8$ (teachers) to $15 \times 8$ (students) oe M1 for $120 + '120 \div 15'$ ( $=128$ ) M1 for $(120 + '8') \div 42 (=3.047\dots)$ or successive subtraction of 42 from '128' C1 (dep on all three Ms) for answer in range 3.04–3.05 or remainder 2 oe AND for correct statement that uses correct values

**Q9.**

5MB3H 01 November 2015				
Question	Working	Answer	Mark	Notes
		17.6	3	M1 for $8 \div 5 (=1.6)$ or $5 \div 8 (=0.625)$ M1 for $(16 - 5) \times "1.6"$ or for $(16 - 5) \div "0.625"$ oe A1 cao

**Q10.**

PAPER: IMA0 2F				
Question	Working	Answer	Mark	Notes
(a)		92.3521	1	B1 cao
(b)		$p^6$	1	B1 cao
(c)		$t^5$	1	B1 cao
(d)		6	1	B1 cao

**Q11.**

Question	Working	Answer	Mark	Notes
	$40 \div 5 = 8$ $8 \times 1.5 = 12$ $(37.6 - 12) \div (40 - 8)$ $= 25.6 \div 32 =$	0.8	4	M1 for $40 \div 5 (=8)$ or at least 3 multiples of 1.4 M1 " $8$ " $\times 1.5 (=12)$ M1 $(37.6 - "12") \div (40 - "8")$ or $25.6 \div 32$ A1 for 0.8, accept 800 g OR algebraic approach: M1 for (eg) $k=4c$ and $k+c=40$ M1 for (eg) $1.5c+wk=37.6$ M1 for " $8$ " $\times 1.5 + "32"$ $\times w = 37.6$ A1 for 0.8, accept 800 g

**Q12.**

5MB3H/01 June 2015				
Question	Working	Answer	Mark	Notes
		$7.5 \times 10^9$	2	M1 for $2.1 \times 10^7$ or 21000000 or eight of figures 75 A1 for $7.5 \times 10^9$

**Q13.**

	Working	Answer	Mark	Notes
*		Not enough mincemeat since $600 < 700$  OR Only able to make 38 mince pies since insufficient mincemeat	4	M1 for $45 \div 18 (= 2.5)$ M1 for 2.5 used as factor or divisor A1 for 562.5 and 875 and 250 and 700 and 2.5 (accept 2 or 3) OR for availables as 400 and 400 and 200 and 240 and 2.4 (accept 2 or 3) C1 ft (dep on at least M1) for identifying and stating which ingredient is insufficient for the recipe (with some supportive evidence)  OR M1 for a correct method to determine the number of pies one ingredient could produce M1 for a correct method to determine the number of pies <b>all</b> ingredient could produce A1 for 80 and 51 and 90 and 38 and 108 C1 ft (dep on at least M1) for identifying and stating which ingredient is insufficient for the recipe (with some supportive evidence)

**Q14.**

Question	Working	Answer	Mark	Notes
		School £8930 Hospital £13395	5	M1 for $23.5 \times 1000$ or for $\frac{1}{20} \times 1000 (=50)$ oe M1 for “23500” $\times \frac{19}{20}$ (=22325) oe or for $(1000 - 50) \times 23.50$ (=22325) oe M1 for “22325” $\div 5$ (= 4465) M1 for “4465” $\times 2$ or “4465” $\times 3$ C1 for £8930 for school and £13395 for hospital.

**Q15.**

5MB3H/01 June 2015				
Question	Working	Answer	Mark	Notes
		71.40	2	M1 for $41.65 \div 7$ A1 for 71.4(0)

**Q16.**

Question	Working	Answer	Mark	Notes
(a)		4.081	2	M1 for $8.875$ or $\frac{71}{8}$ or $2.979\dots$ or $4.08$ A1 for 4.081 or 4.0809(5...)
(b)		$4 \times 10^{-3}$	2	M1 for $4 \times 10^n$ , $n \neq -3$ or $a \times 10^{-3}$ , $a \neq 4$ or $0.004$ or $0.4 \times 10^{-2}$ or $1/250$ A1 cao

## **Examiner's Report**

**Q1.** The vast majority of candidates were able to score 1 mark for summing the given weights of the five ingredients. Very many candidates could go no further. The most common approach thereafter was to work out the number of pots the 96 kg of yoghurt could fill. This was usually correctly calculated but often the final mark was not awarded since the mark scheme did insist on a correct decision and the correct units being quoted for the two totals used for comparison; 'pots' was often omitted. Other equally valid methods were less common but again, in questions assessing Quality of Written Communication, full working and units used must be shown. Some candidates did not explicitly show how they arrived at 768 pots and scored only 1 instead of 3 or 4 marks.

**Q2.** In part (a), although the actual calculation was often performed correctly, many candidates were unable to write their answer correct to two significant figures. The most common error in part (a)(ii) was to write their answer from part (a)(i) correct to two decimal places. Some gave an answer of 13.0 or 13.00, showing that they do not fully understand the concept of significant figures. Some gave 12 as the answer instead of 13. Sometimes in part (a)(i), insufficient digits were written down to gain the mark.

In part (b), a surprising number of candidates failed to give a correct answer, with 50 or 1 million being the most common mistakes made.

**Q3.** Many correct answers were seen, usually without any intermediate working. Those who didn't get the correct answer often gained one mark for showing the digits 252 ( $2.52 \times 10^3$  was a common wrong answer) or for working out the numerator as 4 032 000 000. Many candidates, though, made hard work of this question which could have been done easily with the correct use of a calculator. Many converted the values to ordinary numbers to do the calculation, often resulting in an answer not given in standard form or causing them to lose their way. Errors were frequently made in the evaluation of the numerator with many candidates failing to understand the place value implications of the different powers of 10.

**Q4.** Most students were successful with this question through a variety of approaches. The most common incorrect calculation seen was  $\frac{20}{32} \times 25$ .

**Q5.** Very few students failed to secure the mark in part (a). Some did give their answer as a fraction. This was not penalised provided 0.0045 had been seen. In part (b), students who showed their working generally scored at least one mark. Many who attempted the calculation on their calculator without showing their method often scored no marks at all. It was clear that many students did not know what was meant by the instruction "give your answer in standard form". Many wrote the correct answer in the working space but then wrote different on the answer line; e.g.  $6.578... \times 10^{-6}$  in the working and 6.58 only on the answer line. This failed to score full marks.

**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.** It was pleasing to note that nearly all candidates were in possession of a calculator and knew how to use it correctly. Many candidates lost marks in part (c) because they rounded their answer to 19.68 or 19.7 rather than writing the answer as 19.683. Candidates are advised to always write any answer in full before they round it. This often leads to full marks being awarded.

**Q8.** This question was done quite well. Most candidates were able to find the total number of seats needed (128), calculate the number of seats available (126) and deduce that more seats were needed. Some candidates calculated the number of coaches that would be needed (3.04...) or the number of seats required in each coach (42.6...). A common incorrect approach here was to try and find the required number of teachers by dividing 120 by 16 (rather than 15), and consequently these candidates were unable to make much progress in their solution. A significant number of candidates, having obtained the correct figures, simply stated 'no' as a direct response to the demand of the question. Candidates should be advised to give the reasons for their deductions.

**Q9.** This was well answered. The most common method of solution was using a trial and improvement

approach.

**Q10.** This question about powers proved a bit too difficult for many candidates. Part (a) was the best answered as candidates could use their calculators to work out the correct answer but after this candidates did struggle with  $p^5$  often being given as an incorrect answer for (b). Part (c) was usually better answered and in part (d) a few more gave the correct answer of 6.

**Q11.** This was successfully completed by most candidates. For the rest the first problem was to decide the number of packages and parcels; those misinterpreting the ratio frequently gave incorrect answers of 30 and 10. A significant number spoiled their work by finding  $32 \times 25.6$ .

**Q12.** This question was well attempted by students and it was rare to see blank responses. Most gained full marks though some, having correctly calculated the answer of 7500 000 000, forgot to write it in standard form. Weaker students were usually gaining one mark for either 21 000 000 or, more often, for an answer beginning 75. Only the very weakest were scoring zero. There was also evidence on this question to suggest that, either students had no calculator or were unable to use the standard form key, as many were converting numbers back to ordinary numbers before subtracting and then attempting to divide. Other candidates were not using their calculator correctly or were forgetting to get the answer for the numerator first showing a lack of understanding of the order of operations.

**Q13.** This question was done quite well. Most candidates were able to work out that they needed 2.5 times the quantities in the recipe and were able to scale these quantities accordingly.

A common approach was to add the quantities for  $18 + 18 + 9$  mince pies. Relatively few candidates used the unitary method to find the quantities. A significant number of candidates lost the accuracy mark because they rounded the amount of butter need to 562 or 563, or they omitted to calculate one of the ingredients, usually the eggs.

Those candidates attempting the unitary method often lost the accuracy mark due to premature rounding. Some candidates lost marks because they did not show how they got their answers.

Candidates should be reminded to show all the stages of their calculations particularly in questions involving Quality of Written Communication (QWC).

Most candidates were able to identify a shortage in the mincemeat for the pies, but some just stated that there were not enough ingredients to make the mince pies and did not identify which ingredient was short.

**Q14.** This question was well answered. Clear communication of the final answer including the £ was required for the final mark and sometimes this was not always given. The main issue seen was finding one twentieth of the money received. Several wrong methods were seen finding 20%, 0.5% or just taking away 0.05. When ratios were used, they were usually used correctly.

**Q15.** This question was very well attempted by most students with many gaining the full marks. A common response was £71.4 which, on this particular question, they did not lose the accuracy mark but for other questions this could have led to lost marks. Weaker students were misreading the question and wrote  $12 \times 41.65 = £499.80$ , having not seen that 7 calculators cost £41.65. There was also some evidence to suggest that not all candidates had a calculator as the correct calculations of  $41.65 \div 7 \times 12$  were seen but then an incorrect answer was written, however, as they had written down their working, they did gain the method mark. Only the very weakest students gained no marks, usually due to writing an incorrect answer, sometimes nearly correct, but with no working out. A handful of students wrote £71.04 as the answer having misinterpreted their calculator screen but those that had wrote down their working out did at least gain the method mark.

**Q16.** This question on using a calculator efficiently and dealing with a calculation written in standard form was well answered with most students scoring all the marks. The common mistakes were to find the square root of the whole fraction in (a) and write the answer incorrectly in standard form as  $0.4 \times 10^{-2}$  rather than  $4 \times 10^{-3}$