

# **COUNTDOWN TO YOUR FINAL MATHS EXAM ... PART 2 (2017)**

## **EXAMINERS REPORT & MARKSCHEME**

## **Examiner's Report**

**Q1.** Many students could change between standard form and ordinary numbers to score the marks available in parts (a) and (b). The most frequently seen incorrect responses to part (a) included  $45 \times 10^4$  and  $45^4$ .

Part (c) of the question was not always attempted. When it was attempted, the answer was often correct. Where students were not successful, they had often evaluated the square root or the cube root of 6.4 and included this as part of their answer instead of using their calculator correctly to work out the cube root of  $6.4 \times 10^{10}$ .

**Q2.** All parts were well attempted. In part (c), the only common error was to fail to show the power 3 as negative.

**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.** No Examiner's Report available for this question

**Q5.** This question was poorly answered. Those who had some idea of what to do generally picked up a mark for dividing the real distance by the distance between the models. However, few realised that they also had to deal with inconsistent units having failed to notice that one distance was in m and the other in km and made no attempt to convert between m and km. Some candidates who did spot that units had to be consistent were then unable to change metres into kilometres successfully.

**Q6.** No Examiner's Report available for this question

**Q7.** No Examiner's Report available for this question

**Q8.** Many students did attempt to make a common denominator but often they only managed to get one of the two fractions correctly converted so could only access two of the three marks available. Others added the fractions correctly but forgot to add the whole number. Some started by converting the mixed number into an improper fraction but then could not cope with  $19 \times 7$ . Others left their answer as an improper fraction.

**Q9.** No Examiner's Report available for this question

**Q10.** 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.

**Q11.** No Examiner's Report available for this question

**Q12.** No Examiner's Report available for this question

**Q13.** No Examiner's Report available for this question

**Q14.** No Examiner's Report available for this question

**Q15.** No Examiner's Report available for this question

**Q16.** No Examiner's Report available for this question

## Mark Scheme

Q1.

PAPER: 5MB3H_01				
Question	Working	Answer	Mark	Notes
(a)		$4.5 \times 10^5$	1	B1 cao
(b)		0.00032	1	B1 cao
(c)		4000	1	B1 for 4000 oe

Q2.

	Working	Answer	Mark	Notes
(a)		$3.7 \times 10^{-3}$	1	B1 cao
(b)		49 000	1	B1 cao
(c)	$500 \div 250\,000 [= 0.002]$ OR $(5 \times 10^2) \div (2.5 \times 10^5)$ $[= (5 \div 2.5) \times 10^{2-5}]$ OR $\frac{500}{250} \times \frac{1}{10^3} [= 2 \times 10^{-3}]$ OR $\frac{500 \div 100}{250000 \div 100} = \frac{5}{2500}$ $[= 0.002]$	$2 \times 10^{-3}$	2	M1 for an attempt to divide using two numbers that are in consistent form eg following an attempt to convert to ordinary numbers, or standard form numbers.  A1 for $2 \times 10^{-3}$

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 1MA1: 1H			
Question	Working	Answer	Notes
(a)		$2.5 \times 10^{-24}$	P1 process to estimate or divide  P1 a complete process eg. $(1 \times 10^3) \div (4 \times 10^{-22})$  A1
(b)		Under-estimate	C1 ft from (a) Eg. under estimate as number rounded up but in denominator of fraction

**Q5.**

Question	Working	Answer	Mark	Notes
	16 metres: $8 \times 10^8$ km. 16: $8 \times 10^8 \times 1000$ 16: $8 \times 10^{11}$ 1: $5 \times 10^{10}$  <b>OR</b>  2 m to $10^8$ km 2m to 100 000 000 000m 1m to 50 000 000 000m	$1: 5 \times 10^{10}$	3	M1 (indep) correct method to convert to consistent units  M1 ' $8 \times 10^8$ ' (units may not be '16' consistent) or $5 \times 10^{10}$ oe or $5 \times 10^7$ oe  A1 $1: 5 \times 10^{10}$ <b>or</b> 1: 50 000 000 000  <b>OR</b>  M1 (indep) correct method to convert to consistent units  M1 ' $16/8$ ' to ' $10^8$ '  A1 $1: 5 \times 10^{10}$ <b>or</b> 1: 50 000 000 000

**Q6.**

Question	Working	Answer	Mark	AO	Notes
(a)	$4 \times 3 \times 2000^2$	$48\ 000\ 000\ \text{km}^2$	M	1.3a	M1 for use of $4\pi r^2$ with either $\pi$ or $r$ rounded to 1 significant figure A1 accept $50\ 000\ 000\ \text{km}^2$
(i)			A	1.3a	
(ii)			C	3.4a	C1 for appropriate evaluation of method, e.g. 3 and 2000 both less than true values
(b)	$9.75 \times 10^7 \times 1000 \div (3 \times 10^8)$	325 s	M M A	1.3b 1.3b 1.3b	M1 for use of distance $\div$ time M1 for consistent units A1 cao

**Q7.**

Paper 1MA1: 2F				
Question	Working	Answer	Notes	
(a)			C1	for a correct evaluation of the method shown by giving at least one correct error made, eg. "didn't multiply the 1 by 5"
(b)			C1	for a correct evaluation of the method shown by giving at least one correct error made, eg. "can't split a mixed number" or "should convert to improper (oe) fractions first"

Q8.

5MB2H_01 November 2015				
Question	Working	Answer	Mark	Notes
		$4\frac{8}{35}$	3	M1 for converting both fractions to get a common denominator of a multiple of 35 with at least one correctly converted. M1 (dep on M1) for $3 + \frac{28}{35} + \frac{15}{35} (= 3\frac{43}{35})$ oe A1 for $4\frac{8}{35}$ cao

Q9.

Paper 1MA1:3F			
Question	Working	Answer	Notes
(a)		1:1.5	M1 for 40:(100-40) A1 cao
(b)		$\frac{3}{4}$	B1

Q10.

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

Q11.

Paper 1MA1:3F			
Question	Working	Answer	Notes
		Venn diagram	M1 for two overlapping and labelled ovals M1 for 2 and 6 in the intersection M1 for 5 and 7 in the universal set only C1 for a fully correct Venn Diagram

**Q12.**

Paper 1MA1: 3H			
Question	Working	Answer	Notes
(a)	Draws correct Venn diagram	$\frac{44}{50}$	<p>M1 Begin to interpret given information eg. 3 overlapping labelled ovals with central region correct</p> <p>M1 Extend interpretation of given information eg. 3 overlapping labelled ovals with at least 5 regions correct</p> <p>M1 Method to communicate given information eg. 3 overlapping labelled ovals with all regions correct including outside</p> <p>A1 oe</p>
(b)		$\frac{21}{44}$	<p>P1 For correct process to identify correct regions in Venn diagram and divide by '44'</p> <p>A1</p>

**Q13.**

Question	Working	Answer	Notes
(a)(i)		10, 12, 14, 15, 16, 18	B1 cao
(ii)		12, 18	B1 cao
(b)		$\frac{7}{10}$	<p>M1 for 7 or indicating correct region or for 10, 14, 16, 11, 13, 17, 19 listed</p> <p>A1 for <math>\frac{7}{10}</math> oe</p>

**Q14.**

Paper 1MA1: 2F			
Question	Working	Answer	Notes
		0.4375	B1 cao

**Q15.**

Question	Working	Answer	Notes
		60	B1 cao

**Q16.**

Question	Working	Answer	Notes
		$\frac{19}{100}$	B1 cao