



# Countdown to your final Maths exam ...

## Crossover part 3 (2020)

### Markscheme & Examiners Report

#### Examiners Reports

- Q1. Although part (a) of this question was well attempted by candidates many incorrect attempts were seen. Common incorrect responses were 4, 2 and 16. Candidates were more successful in part (b) and wrote 1000, however, a common incorrect response was  $10 \times 10 \times 10$  with no final evaluation. Part (c) was the least successful part of the question with only a few candidates offering correct responses, the most common of which was 4.5. Common incorrect responses included 4 and 5, along with multiples and factors of 20 written with and without a square root sign.
- Q2. It was rare to see an estimation attempted; the majority of candidates worked with the figures given in the question. Much time was wasted by candidates engaging in long drawn out multiplication calculations. Most managed to score at least 1 mark in this question by attempting  $2.95 \times 21 \times 39$ .
- Q3. Part (a) was generally well done although in some cases the answer was not fully simplified. Part (b) was also well done although some candidates on obtaining an answer of 12 went on to multiply this number by 28 to get (£) 336. Part (c) was mainly done by rounding 19.89 to 20 and 201.71 to 200 eventually giving a final answer of 4000. Alternatives were to round to 202 or 201 giving answers of 4040 and 4020 respectively, both of which were accepted for both marks. Candidates who attempted to work out the accurate calculation were given no marks.
- Q4. This proved to be a good opening question with the most students scoring all 3 marks. The most common error was to just write down the discount of £150 as the answer.
- Q5. The vast majority of candidates (90%) scored full marks here. About 5% of candidates subtracted £24 from £60 and gave £36 as their answer or added the £24 to give £84. In this functional maths question, examiners were unable to award full marks for this.
- Q6. Many students scored full marks. The most common error was poor calculation of  $\frac{900}{20}$  with answers of 40.5, 405 or 450. Students who tried to calculate the accurate answer rather than an estimate failed to score any marks despite having done copious amounts of working out.
- Q7. Those candidates who attempted to obtain the answer through calculation and not rounding were awarded zero marks. Most candidates used numbers such as 30, 10 or 0.5 and gained a mark through realising that simplified numbers were needed. Having worked out a simplified numerator, many candidates then appeared to be confused as to what to do with their 0.5, many multiplying by 0.5 or dividing by 2 to get 150. It was unusual to see candidates stating that they wanted to calculate  $300 \div 50$ ; they more usually gave an incorrect answer arising from these two numbers.
- Q8. This question was well attempted by almost all candidates. Of those that failed to score full marks, most were making basic arithmetic errors or incorrectly calculating 10%. The most common repeated error was to only calculate 20% of 35 giving £7.00 as their final answer. It was rare to see answers of £28 where students had incorrectly subtracted the 20%.
- Q9. 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.

- Q10. A good number of students were able to gain full marks for this question and if not full marks then M1 for  $\frac{9}{20}$  was often awarded. A few students tried to do  $20 \div 9$  and some others added the ratio parts incorrectly; 22 was frequently seen but this was not helpful in finding the percentage they required.
- A small number of students found the percentage of the wrong colour, generally red buttons as this was the first part of the ratio; a full method for a colour other than orange was awarded M1, but students should be reminded to read questions carefully to maximise their potential to gain marks.
- Q11. This question was answered in a variety of ways. An approximation was required but a few number of students tried to work out the actual calculation. This is a non-calculator paper and as such students should realise that complex arithmetic would not be set. There were also some who said  $42 = 8$ , however this misconception was not seen too often.
- For those who tried to approximate many rounded to 600 or used 5 thus securing 1 mark. Others went further and got to  $600 \div 21$ , some then just wrote an answer of Ami or Josh without further justification, this gained 2 marks. The most successful correct answer was to get to  $60 \div 21$  and then to show  $600 \div 20 = 30$  or  $20 \times 30 = 600$  thus allowing the student to justifiably select Ami or 27.1115 as the appropriate answer.
- Q12. The most common mistake was calculating 20% of 464 (=92.8) and then having variations of  $464 \pm 92.8$ . Of those who correctly recognised that 464 was 80% on original price many incorrectly gave 580 as the final answer, even though many had correctly already calculated 116 as the reduction.
- Q13. Many candidates could not reduce the cost of the car by 20%. They either ignored the 20% or worked out  $6720 - 20$  or even  $6720 - 0.20$ . They could still get the next two marks for subtracting 1500 and then dividing by 24. However, some missed the subtracting 1500 part and gained no marks.
- It was not unusual to see a candidate work out 20% of £6720 correctly to get the answer £1344 and then follow it with  $£1500 - £1344$  followed by the division by 24
- A number of candidates successfully arrived at £3876 but then divided by 12 rather than 24
- Q14. Candidates right across the ability range were able to score marks in this question. This multi-step question gave a good distribution of marks, as it was possible to award marks for the subtraction of 900 and the division by 6 independently of the addition of the calculation of 20% of £3500. Surprisingly, a large number of candidates were unable to find 20% of a quantity with many dividing by 20 and trying to use £175. These candidates did not score the second method mark as we needed to see a correct method for increasing £3500 by 20%.
- Q15. Responses to this question started well. Most were able to calculate the profit on either one bottle or 12 bottles. The £0.36 profit was often seen. A significant number of students stopped there, sometimes giving 0.36 as their answer. Many students erroneously took the base for comparison as their selling price, £6 rather than £5.64 cost price. Some appeared to get as far as 1.063 but then rounded to 1.1

## Mark Scheme

### Q1.

Question	Working	Answer	Mark	Notes
(a)		64	1	B1 cao
(b)		1000	1	B1 for 1000 or one thousand
(c)		$4 < \text{answer} < 5$	1	B1 for $4 < \text{"answer for } \sqrt{20} < 5$ [accept answer in words, eg. "greater than 4 and less than 5"]

### Q2.

Question	Working	Answer	Mark	Notes
		2400	3	B1 for one of 20, 40, 3 or 300 M1 for "20"x"40"x"3" or "20"x"40"x"300" (values do not need to be rounded) A1 for answer in range 2280 – 2520  SC : Award B3 for an answer of 2400 if no working seen  NB. An answer of 2416.05 implies B0 M1 A1

### Q3.

5MB2H/01 June 2015				
Question	Working	Answer	Mark	Notes
(a)		$5\frac{1}{4}$	1	B1 for $5\frac{1}{4}$ oe
(b)		12	2	M1 for $(28 \div 7) \times 3$ oe A1 cao
(c)		4000	2	M1 for 20 or 200 A1 for 4000 – 4040

### Q4.

PAPER: 5MB2H_01				
Question	Working	Answer	Mark	Notes
		350	3	M1 for finding 30% of 500 (=150) M1 dep for subtraction of discount from 500 A1 cao  OR M1 for $1 - 0.3 (= 0.7)$ M1 dep for $500 \times "0.7"$ A1 cao

### Q5.

Question	Working	Answer	Mark	Notes
	$10\% = 6$ $6 \times 4 = 24$	24	2	M1 $40 \div 100 \times 60$ oe or any complete method, eg $10\% = 6, 6 \times 4$ A1 cao  SC B1 for 36 or 84

### Q6.

Question	Working	Answer	Mark	Notes
		44 - 56	2	B2 for 44 - 56 (B1 for 1000 or 900 or 20 or 18 or 19, unless it is clear these have not come from estimation)

**Q7.**

Question	Working	Answer	Mark	Notes
		600	3	(M2 for $300 \div 0.5$ or $60 \times 10$ or $30 \times 20$ ) M1 for at least two of 30, 10 and 0.5 or sight of 300 or 60 or 20 A1 for 600 – 620 but not 601.1(198428...)  <b>OR</b> (M2 for $310 \div 0.5$ or $62 \times 10$ or $31 \times 20$ ) M1 for at least two of 31, 10 and 0.5 or sight of 310 or 62 or 20 A1 for 600 – 620 but not 601.1(198428...)

**Q8.**

Question	Working	Answer	Mark	Notes
		42	3	M1 for correct method to find 20% of 35 (=7) M1 for correct method to increase 35 by 20% A1 cao

**Q9.**

Question	Working	Answer	Mark	Notes
		80	B1	cao

**Q10.**

Question	Working	Answer	Mark	Notes
		45	M1	for a correct first step eg $\frac{9}{7+4+9} (= \frac{9}{20})$ or $\frac{100}{7+4+9} (=5)$ or a full method for one of the other colours
			A1	cao

**Q11.**

Question	Working	Answer	Mark	Notes
		Ami	M2	for an approximate calculation eg $\frac{600}{16+5}$ or $\frac{600}{21}$ or $\frac{600}{20}$ or $\frac{600}{20+5}$ or $\frac{600}{25}$ or $\frac{600}{25+5}$ or $\frac{600}{30}$ or $\frac{595}{20}$
		with estimate	(M1)	for using 600 or 5 or 4)
			C1	Ami's answer /27.1115 is closest with accurately calculated figure from approximation

**Q12.**

PAPER: IMA0 2H				
Question	Working	Answer	Mark	Notes
		116	3	M1 for 80% or 0.8 seen oe or $\frac{464}{0.8}$ (=580) M1 for $\frac{464}{0.8} - 464$ A1 cao <b>OR</b> M1 for 80% or 0.8 seen oe M1 for $464 \div 4$ or $464 \div (80 \div 20)$ A1 cao

**Q13.**

Question	Working	Answer	Mark	Notes
		161.50	5	M2 for a correct method to decrease 6720 by 20%, eg $6720 \times 0.8 (= 5376)$ or $6720 \times 0.2 (= 1344)$ and $6720 - 1344 (= 5376)$ (M1 for a correct method to find 20% of 6720 eg $6720 \times 0.2$ or $\frac{20}{100} \times 6720 (= 1344)$ ) M1 for subtracting 1500 (= 3876) after a percentage calculation M1 " $3876 \div 24$ " after the subtraction of 1500 A1 for 161.5(0)

**Q14.**

Working	Answer	Mark	Notes
	550	5	M1 for a correct method to find 20% of an amount eg $3500 \times 0.2$ oe (=700) M1 for a correct method to increase an amount by 20% eg $3500 \times 1.2$ oe (=4200) M1 for subtracting 900 M1 for division by 6 A1 for 550 NB : Operations may occur in any order as long as they could lead to the correct answer. Award marks until a breakdown of method occurs

**Q15.**

Question	Working	Answer	Mark	Notes
	$\pounds 6 - \pounds 5.64 = 36\text{p}$ or $50\text{p} - 47\text{p} = 3\text{p}$	6.4	P1	for a strategy to compare the same number of bottles e.g. $\pounds 5.64 \div 12$ ( = 47 or 0.47) or $12 \times 50\text{p} (= 6 \text{ or } 600)$ or 36 or 0.36 or 3 or 0.03
			P1	for start of process to find percentage profit e.g. $\frac{36}{564}$ or $\frac{3}{47}$ or $\frac{6}{5.64}$ or $\frac{50}{47}$ oe with consistent units
	6.3829787 ...%		A1	for answer in the range 6.3 to 6.4