"Between Papers" Practice

Set 2 of 4 (F&H)

Summer 2018

Examiners Report & Markscheme

Not A "best" Guess paper.

Neither is it a "prediction" ... only the examiners know what is going to come up! Fact! You also need to REMEMBER that just because a topic came up on paper 1 it may still come up on papers 2 or 3 ...

We know how important it is to practice, practice, practice .... so we've collated a load of questions that weren't examined in the Pearson/Edexcel 9-1 GCSE Maths paper 1 but we cannot guarantee how a topic will be examined in the next papers ...

Enjoy!
Mel & Seager

Q1. This question was a good discriminator. There were a number of possible routes to finding the length of CE and various approaches were seen by examiners. The most able students produced a concise and accurate solution sometimes involving surds rather than giving interim values as decimals. A large proportion of students were able to find either the width of the rectangle ADCB or the length of its diagonal. Both of these lengths are helpful in providing a fully correct method so were given due credit. Many students also realised that they needed to find the size of a further angle in order to make further progress and this was also given credit. Far fewer students were able to give a fully correct solution. A small proportion of students wrote down 16 cm as their answer without any interim working. They were not awarded the marks. Students are advised that they should always show their working. This question included "You must show all your working" in the demand and students who showed no working were not awarded any marks as it was felt that "16" might have been the result of a guess rather than a correct method. Any working seen in response to this question often lacked clarity or a logical order and this is something which centres may like to make students aware of.

Q2. This reverse percentage question provided a straightforward test for many of the more able candidates who found the calculation routine. There was however a large proportion of candidates who did not understand what they needed to do and merely added 30% on to the sale price so £455 was a very commonly seen incorrect answer. Although candidates who equated £350 with 70% usually went on to get the correct answer, some of them then seemed to ignore the statement they had just written down and instead calculated 10% of 350 leading to an incorrect answer. Candidates who wrote £350 = 70% then £50 = 10% were generally more successful than candidates who attempted to calculate £350 ÷ 0.7 Candidates who gave incorrect answers such as £50 or £150 might have found their error if they had carried out a common sense check on the size of their answer after reading the question again.

Q3. it was not uncommon to find candidates mixing these measures up in their attempts to answer the question. In part (b) some candidates failed to order the numbers before selecting the middle one, whilst in (c) attempts were flawed by poor arithmetic.

Q4. The correct answer was often seen but not always the result of the most straightforward method. Many candidates found the length *DF* by Pythagoras and then used sine or cosine. Some even attempted to use the sine rule. However, many choosing these alternative approaches made careless mistakes in their algebraic manipulation and failed to score as a result.

A significant number started well with "tan = $\frac{86}{37}$" but could go no further.

Q5. The mode was not understood by many, with an almost random array of answers from any of those shown either as a frequency or as the number of badges. In contrast in part (b) there were many attempts to calculate fx from the table. Unfortunately many solutions were spoilt when the divisor used was either 6 or 15, rather than the correct 25. It was disappointing to find Higher level candidates who thought that 0 × 2 was 2.

In part (c) there were very few correct answers. Although some realised they had to find the total number of older girls by calculating 15 × 4.4, even these failed to realise what to do with the result of this calculation.

Q6. There remains a lot of confusion about the process to find the mean from a grouped frequency table. In most cases midpoints were used, rather than end points. The most common error in the first stage was to use the interval (50) rather than the midpoint, though some merely added the four frequency values. It was not uncommon for the final stage to be spoilt by a division of 4 rather than 40.

Q7. Working with the mean is not well understood, as exemplified by the many confused solutions given to this question. Some attempted to make a comparison without undertaking any calculations, but marks were only given for a conclusion if such a calculation was attempted. Few attempted to work backwards using the given information in the statement, though this was a valid method. Most who arrived at a re-calculated mean then went on to make a sound conclusion.

Q8. Whilst many students realised the 'compound' nature of the problem, many simply find the depreciation for one year and then doubled it for two. Some students worked out the value of the car at the end of a third year and some actually added on the 25% each year, thus increasing the value of the car.

Q9. Many candidates correctly found the interest over 3 years for investment A but only found the

interest for investment B for 1 year. This meant they could only score a maximum of 1 mark. Others struggled to find 2.5% of 2500. There were however, many well thought-out responses. Some of these found the total interest whilst others compared the value of the investment at the end of the three years. Those that tackled the problem by looking at monthly interest tended to make errors when doing calculations for Investment B. It was pleasing to see that most working was clearly set out.

Q10. Multiplying the first term in the bracket only and leaving the second unchanged, ie $3x + 2$, was the most common incorrect answer and $3x + 5$ was often seen. A few did not score the final accuracy mark by continuing to 'simplify' their final answer, writing $3x + 6 = 9x$. Very few answers reflected no understanding of the algebra involved.

In part (b) most students found some common factors and divided well. Candidates need to ensure that they find the highest common factor, particularly for the number part of each term. They need to look at the terms left in the bracket to see if anything is still a factor. Candidates should be encouraged to check their answer by expanding as answers such as $6xy(2x^2 - 3xy)$ were occasionally seen.

In part (c) This question was well answered with a majority of candidates familiar with the need to find four terms and many also correctly dealing with the signs and simplification of the answer. 43% of candidates could expand and simplify correctly with a further 24% able to provide 4 correct terms (ignoring the signs) or 3 correct terms with the correct signs. The most common errors were incorrect signs, incorrect product of $2x$ and x, an incorrect simplification of $-3x + 8x$ or a constant term of +1

In part (d) it was pleasing to see that nearly 60% of the candidates obtained the correct answer with a further 12% scoring one mark for obtaining 2 correct parts of the expression $10x^7y^5$. The most common error was to add the coefficients with 7 x^7y^5 frequently seen. Others left multiplication signs in their answer or occasionally an addition sign.

Q11.A sizeable number of students made no attempt at this question and it was rare to see a fully correct answer. However, many students were able to state at least one bound (either 4.755 or 4.765) and were rewarded with one mark out of the two marks available. Where inequality signs were used by students, and this was not very common, they were often used incorrectly.

Q12. Readings taken from the travel graph were usually correct and the majority of candidates gained full marks in parts (a) and (b). The success rate in the completion of the graph using the given information in part (b) was lower. Many correctly identified the 30 minutes when stopped but were often confused in knowing where 'home' was. Some lost marks by drawing lines that were broadly correct but inaccurate. Candidates need to be encouraged to take care with accuracy as some lost marks for drawing too long a horizontal line, with subsequent inaccuracies in the gradient of the return journey home, with the final section of the graph having a positive gradient rather than negative.

Q13. The vast majority of students were able to show they could enlarge the given triangle by a scale factor of 2 to gain at least 1 mark but far fewer were able to centre their enlargement on point A. A small proportion of students scored 1 mark for 2 correct points or for an enlargement, scale factor 3, centre A.

Q14. The majority of candidates were able to answer (a) correctly. Occasionally (11.5, 73) was not plotted or on the wrong y coordinate, otherwise very well done.

In part (b) most candidates described a dynamic relationship correctly with a minority using the words 'positive correlation'. A few though talked in terms of the gradient of the line rather than interpreting the relationship in correlation terms. Additionally a few candidates stated negative correlation or some used the phrase 'hotter' instead of hours of sunshine.

In part (c), the majority of candidates gained 2 marks. Where a line of best fit was drawn, it rarely failed to be within limits and candidates were usually successful in finding a correct answer. A substantial number did not draw a line of best fit however even then, the majority of answers were within range. Errors were often made by misreading the y-axis, common to see 67 marked with 77 on the answer line. Insufficient candidates drew the line x=10 up to the 'line' and across.

Q15. Candidates who did not initially multiply out the brackets correctly ran into problems soon after. Many errors resulted from poor rearrangement and $2y - 3$ was frequently seen.

Q16. Part (a) was done well. Many candidates were able to divide 0.9 in the ratio 1:2 (usually by

inspection), but some incorrectly gave 0.6 on the answer line. A very common error here was $\frac{1-0.1}{2}$ (=0.45).

Part (b) was not done well. Few candidates could work out the required probability by calculating $(0.1)^3$. A very common incorrect answer here was 3×0.1. Some candidates, having reached the correct calculation ($0.1 \times 0.1 \times 0.1$) were unable to evaluate this correctly. A common incorrect answer here was 0.01.

Part (c) was not done well. Only the best candidates opted for the direct approach and were able to deal with the probabilities 0.3 and 0.7 correctly to arrive at the correct calculation (usually by drawing a tree diagram). Many candidates attempted this question by dealing with all three probabilities 0.1, 0.3 and 0.6 and drawing a tree diagram with 27 outcomes. Few of those candidates attempting this approach were able to select all the correct outcomes for the required probability.

Q17. Many candidates were able to secure at least one mark having found a single angle using a straightforward angle rule such as opposite angle or angles on a straight line. Although this particular question did not require explanations, poor angle notation in calculations meant some candidates who did not reach the final answer lost part marks which may have otherwise been awarded. However, others labelled angles on the diagram and so did gain credit. Angle rules involving parallel lines presented more difficulties with many identifying the co-interior angle AFH as 110, equal to CHF rather than 70. Whilst candidates need to appreciate that a diagram such as this has not been accurately drawn, in this case considering whether the geometry would lead to an angle greater than or less than 90° would be a useful check on the reasonableness of an answer.

Q18. The question was well answered. Most students successfully worked out the total mass of the drink. This gained two marks. Some students stopped at this point, hence explaining why two marks was a common score on this question. Those students that carried on with the problem usually successfully completed it.

Centres are advised to remind students to check they have answered the question asked fully.

A small number of students calculated the total mass incorrectly by inverting the density formula. This was the main misconception seen.

Q19. This provided lots of differentiation, and was a challenge to many candidates. Those who realised that a 2-way table was the best way of organising the data made considerable in-roads to the solution. Unfortunately many who merely tried to work with lots of smaller calculations became utterly confused with what they were trying to find. Some credit was given for some calculations, as long as they were deemed as "staging posts" as part of a coherent strategy working towards a solution.

Q1.

PAPER: 1MA0_2H				
Question	Working	Answer	Mark	Notes
	$BC = \frac{12}{\tan 60} = 6.92(8\ldots)$ $DE = 6.92(\ldots) \times \tan 30 = 4$ $CE = 12 + 4$ $AC = \frac{12}{sin60} = 13.8(5\ldots)$ $CE = \frac{13.8(5\ldots)}{cos30}$	16 with supporting working	4	M1 for a method to find BC or AC or AD B1 for angle EAD = 30° or AED = 60° or ACD = 30° or CAD = 60° M1 for a method to find CE A1 for 15.9-16.1 with supporting working

Q2.

		Working	Answer	Mark	Notes
			£500	3	M1 for 70% = 350 or $^{350}/_{70}$ M1 for $^{350}/_{70} \times 100$ oe A1 cao

Q3.

		Working	Answer	Mark	Notes
	(a)		33	2	M1 for 45 – 12 or 12 to 45 or 24 – 20 A1 cao
	(b)	12, 15, 15, 18, 20, 20, 22, 24, 25, 32, 36, 45	21	2	M1 for arranging the numbers in order or stating 28.5 A1 for 21 cao
	(c)	(12+15+15+18+20+20+22 +24+25+32+40+45) ÷ 12	24	2	M1 for attempt to add and divide by 12

Q4.

PAPER: 5MB3H_01				
Question	Working	Answer	Mark	Notes
		66.7	3	M1 for $\tan(y =) \frac{86}{37} (= 2.3243..)$ M1 (dep) for $\tan^{-1}$ "2.32(43..)" = or $\tan^{-1}(\frac{86}{37})$ (accept 'shift tan' or 'inv tan' for $\tan^{-1}$) A1 for answer in the range 66.6° to 66.8° [SC: B1 for an answer in the range 23.2 to 23.3 if M0 scored]

Q5.

5MB1H/01 June 2015				
Question	Working	Answer	Mark	Notes
(a)		1	1	B1 cao
(b)		2.4	3	M1 for Σ(number of books × frequency) (=60) M1 for "60" ÷ "25" A1 cao SC B2 for an answer of 2.48
(c)		3.15	3	M1 for 15 × 4.4 (=66) M1 for a complete method eg ("60" + "66") ÷ (15 + "25") A1 cao

Q6.

5MB1H_01					
Question		Working	Answer	Mark	Notes
		425× 9 475×15 525×12 575×4 19 550 ÷ 40	488 - 489	4	M1 for fx with x consistent within intervals (including the end points) allow one error M1 (dep) for use of all correct mid-interval values M1 (dep on first M1) for $\sum fx \div 40$ A1 for 488 – 489

Q7.

Paper_5MB1H_01				
Question	Working	Answer	Mark	Notes
*		Justification	4	M1 for method to find total mileage eg 55 × 5 + 50 (= 325) M1 for method to find mean eg 325 ÷ 6 A1 for 54.1 – 54.2 C1 (dep on at least M1) for justification comparing means. OR M1 for method to find total mileage for Andy's mean 52.5 × 6 (= 315) M1 for method to find correct total mileage 55 × 5 + 50 (= 325) A1 for 315 and 325 C1 (dep on at least M1) for justification comparing correct totals

Q8.

Paper: 5MB3H_01					
Question		Working	Answer	Mark	Notes
			2700	3	M1 for a correct method to find 25% of 4800 (= 1200) M1 for a fully complete and correct method to find the value of the car at the end of 2015 A1 cao OR M2 for $4800 \times (0.75)^2$ A1 cao

Q9.

PAPER: 5MB1F_01					
Question		Working	Answer	Mark	Notes
*			Investment B	4	M1 for 3×12×5 (= 180) M1 for 2500 × 3 × 2.5 ÷ 100 (= £187.50) A1 for (£)180 and (£)187.5(0) or (£)2680 and (£)2687.5(0) C1 (dep on M2) for correct conclusion for their figures Alternative method: M1 for 12 × 5 = 60 M1 for '60' ÷ 2500 × 100 A1 for 2.4(%) C1 (dep on M2) for correct conclusion for their figures NB: accept comparable figures for different time periods SC: If compound interest used can score M1 M0 A0 C1 ft

Q10.

Question	Working	Answer	Mark	Notes
(a)		$3x + 6$	2	M1 for attempted expansion of the bracket eg $3\times x$ and 3×2 seen or $3x + k$ or $kx + 6$ A1 for $3x + 6$
(b)		$6xy(2x^2 - 3y)$	2	M1 or $6xy$ (two terms involving x and/or y) or correct partial factorisation by taking out two from 6 (or 3 or 2) or x or y A1 cao
(c)	$2x^2 + 8x - 3x - 12$	$2x^2 + 5x - 12$	2	
(d)		$10\ x^7\ y^5$	2	M1 for 3 out of 4 correct terms with correct signs, or all 4 terms ignoring signs A1 cao B2 for $10\ x^7\ y^5$ (B1 for product of two of 5×2 oe, x^{4+3}, y^{3+2} ignore $\times$ signs)

Q11.

Question	Working	Answer	Mark	Notes
		$4.755 \leq n < 4.765$	B2	for $4.755 \leq n < 4.765$
			[B1	for 4.755 or 4.765 or $4.764\dot{9}$]

Q12.

		Working	Answer	Mark	Notes
	(a)		30	1	B1 for 30 minutes oe
	(b)		20	1	B1 cao
	(c)		graph completed	2	B1 for horizontal line from (5, 20) to (5.30, 20) B1 for a single straight line with the correct gradient from '(5.30, 20)' to the time axis

Q13.

PAPER: 1MA0 2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
		Enlargement	2	B2 for fully correct triangle (B1 for 2 vertices correct or enlargement scale factor 2 in the wrong position or enlargement, centre A, with a different scale factor)

Q14.

Question	Working	Answer	Mark	Notes
(a)		Point at (11.5, 73)	1	B1 Point plotted ±½ small square
(b)			1	B1 for description of dynamic relationship eg "the more hours of sunshine, the more ice creams sold" or positive correlation]Note: 'sunnier' implies 'more hours of sunshine']
(c)		62 - 70	2	B2 for answer in the range 62-70 OR M1 for a single straight line of best fit with positive gradient, passing between (6.5, 45), (6.5, 59) and (12, 70), (12, 80) or a vertical line drawn from 10 A1 for answer in range 62-70 or ft from single straight "line of best fit" with positive gradient

Q15.

		Working	Answer	Mark	Notes
		$4x - 3 = 2x + 2y$ $2x - 3 = 2y$ $2x = 2y + 3$ $x = y + 1.5$	$x = y + 1.5$	3	M1 for attempt to expand brackets eg $2\times x+2\times y$ or divide through by 2 (each term). M1 for attempt to get x on one side of equation. A1 for $(x =)\ y + 1.5$, $\frac{2y+3}{2}$, oe

Q16.

Question		Working	Answer	Mark	Notes
	(a)	1 – 0.1 0.9 ÷ 3	0.3	2	M1 for (1 – 0.1) ÷ 3 or 0.1+0.3+0.6(=1) or 0.6÷2 A1 for 0.3 oe
	(b)	0.1 × 0.1 ×0.1	0.001	2	M1 for 0.1 × 0.1 ×0.1 oe A1 for 0.001 oe
	(c)	1 – (0.7 × 0.7 × 0.7) OR 3 × 0.3 × 0.3 × 0.7 + 3 × 0.3 × 0.7 × 0.7 + 0.3 × 0.3 × 0.3 OR 3 × 0.3 × 0.3 × (0.1 + 0,6) + 3 × 0.3 × (0.1 + 0.6) × (0.1 + 0.6) + 0.3 × 0.3 × 0.3 OR 0.3 × 0.3 × 0.3 + 3 × 0.3 × 0.3 × 0.6 + 3 × 0.3 × 0.3 × 0.1 + 3 × 0.3 × 0.6 × 0.6 + 3 × 0.3 × 0.1 × 0.1 + 6 × 0.3 × 0.6 × 0.1	0.657	3	M1 for 0.7×0.7×0.7 or ft (1 – 'a')×(1 – 'a')×(1 – 'a') M1 for 1 – 0.7×0.7×0.7 or ft 1 – (1 – 'a')×(1 – 'a')×(1 – 'a') oe A1 for 0.657 oe (SC B1 for 0.784 oe) OR M1 for 0.3 × 0.3 × 0.7(=0.063) or 0.3 × 0.7 × 0.7(=0.147) or 0.3 × 0.3 × 0.3(=0.027) oe M1 for 3 × 0.3 × 0.3 × 0.7+ 3 × 0.3 × 0.7 × 0.7+ 0.3 × 0.3 × 0.3 oe A1 for 0.657 oe (SC B1 for 0.784 oe) OR M1 for 0.6 × 0.6 × 0.6(=0.216) or 0.1 × 0.6 × 0.6(=0.036) or 0.1 × 0.1 × 0.6(=0.006) or 0.1 × 0.1 × 0.1(=0.001)oe M1 for 1– (0.6 × 0.6 × 0.6 + 3 × 0.1 × 0.6 × 0.6 + 3 × 0.1 × 0.1 × 0.6 + 0.1 × 0.1 × 0.1) oe A1 for 0.657 oe (SC B1 for 0.784 oe) OR M1 for 0.3 × 0.3 × 0.3 or 0.3 × 0.3 × 0.6 or 0.3 × 0.3 × 0.1 or 0.3 × 0.6 × 0.6 or 0.3 × 0.1 × 0.1 or 0.3 × 0.6 × 0.1 oe M1 for 0.3 × 0.3 × 0.3 + 3 × 0.3 × 0.3 × 0.6 + 3 × 0.3 × 0.3 × 0.1 + 3 × 0.3 × 0.6 × 0.6 + 3 × 0.3 × 0.1 × 0.1 + 6 × 0.3 × 0.6 × 0.1 oe A1 for 0.657 oe (SC B1 for 0.784 oe)

Q17.

Question	Working	Answer	Mark	Notes
	$BFD = 42°$ $HFB = 110°$ 110 – 42	68	3	M1 for $EDC = 42$ or $DHF = 180 - 110$ M1 for 180– 42 – 70 A1 cao **or** M1 for $BFD = 42°$ or $HFB = 110°$ M1 for 110 – 42 A1 cao **or** M1 for $AFH = 180 - 110 = 70$ M1 for 180– 70 – 42 = 68 A1 cao

Q18.

Question	Working	Answer	Mark	Notes
		1.01	P1	fruit syrup 15 × 1.4 (= 21) or water 280 × 0.99 (= 277.2) or apple juice 25 × 1.05 (= 26.25)
			P1	(dep P1) for complete process to find the total mass e.g. "277.2" + "26.25" + "21" (= 324.45) or a weighted density eg 15 × 1.4 ÷ 320 (= 0.065625) or 280 × 0.99 ÷ 320 (= 0.86625) or 25 × 1.05 ÷ 320 (= 0.08203125)
			P1	(dep P2) for complete process to find the density eg "324.45" ÷ 320 (=1.01..) or "0.065625" + "0.86625" + "0.08203125" (= 1.0139..)
			A1	1.01 to 1.014

Q19.

		Working	Answer	Mark	Notes
			29	4	M1 for complete correct method to find the total number of girls eg 120 – 30 (=90) M1 for a complete correct method to find the number of girls who play Football and hockey eg 26 + 35 (=61) M1 for "90" – "61" A1 for identifying 29 as the answer **OR** M1 for a complete correct method to find the total number playing tennis M1 for a complete correct method to find the number of boys playing tennis M1 for "total for tennis" "boys playing tennis" A1 for identifying 29 as the answer