"BETWEEN PAPERS" PRACTICE

SET 1 OF 2 - F&H (MOST QUESTIONS!)

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 OR PAPER 2 IT MAY STILL COME UP ON PAPER 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 OR PAPER 2 BUT WE CANNOT GUARANTEE HOW A TOPIC WILL BE EXAMINED IN THE NEXT PAPERS ...

ENJOY!
MEL & SEAGER

Q1. Many candidates gained full marks for this question, often with no intermediate working. Those who didn't give the correct answer usually scored one mark for evaluating the numerator as 6.4 or the denominator as 4.62. Candidates who failed to show any working and rounded or truncated their answer did not gain any marks. The standard mistake of entering the numbers into the calculator without using brackets, in this case for the denominator, was seen less frequently than in the past.

Q2. Part (a) was generally well answered.

There were problems for candidates with part (b) because the scale on the Judge A axis went up in 2s so many looked above 48 rather than 44. The practice of looking at the two values nearest the gap and halving the two values was seen more often.

This usually leads to an acceptable answer. Here it led to (42 + 56) ÷ 2 giving 49. However, many candidates could not read the judge B scale correctly as it went up in 2s also. In many cases answers were given just outside the accepted tolerance but were awarded no marks as there was no supporting work on the scatter diagram.

Q3. This was quite well answered with little confusion between the three statistical calculations requested. In part (b) numbers were usually ordered, but weaker students were confused by not having a single number in the centre of their list, sometimes choosing either one of the numbers as their answer, to find the mean of their two numbers. In part (c) the most common error was in calculating 12 × 6 rather than 12 × 7.

Q4. This question was well attempted by most candidates with many gaining full marks. A common mistake was the division by 4 instead of 50, either 328÷50 gaining M2 or 50÷4 gaining M0. Other common errors were the use of 4 for the mid-value of all groups gaining M0 and less frequently the use of the lower or upper bound instead of the mid-value. Despite the allowance of calculators, many candidates made computation errors and often when they were using the correct method so only gained a maximum of M3. Another common incorrect answer which often followed some correct working was $4<w\leq 8$, the modal group.

Q5. 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.

Q6. The most common incorrect answer was 1.04, which resulted from candidates forgetting to put in a bracket after the 60 in tan(60) on their calculators and, in effect, working out $\sqrt{\frac{\tan 61^\circ}{\tan 59^\circ}}$ rather than $\sqrt{\frac{\tan 61^\circ + 1}{\tan 60^\circ - 1}}$. The main misconception arose when candidates took the square root of the numerator rather than the whole quotient. Marks were available for the correct intermediate steps. There were a number of incorrect responses with no working out that might have otherwise gained a mark.

Q7. This question was worth 6 marks so it was somewhat surprising to see that some candidates limited themselves to a brief comment stating that heart rates were higher after people had walked up the stairs. Examiners were able to give this little credit without any supportive evidence. At the other extreme a significant number of candidates worked out the mode, median, mean, range and interquartile range for "before" and "after". Some then made an attempt to interpret their findings whilst others judged that they had completed the question once the calculations were done. What was required, of course, was the calculation and comparison of an appropriate average (i.e. the median or mean) for "before" and "after", the calculation and comparison of an appropriate measure of spread (i.e. the range or interquartile range) and then some interpretation in the context of the question. Most candidates were able to score marks for the calculations, but far fewer were able to deduce that the hearts rates had risen (due to the rise in the average considered) and that they were more varied after the 15 people had walked up the stairs (due to the rise in the measure of spread considered). Common errors included giving "60" as the median and "81" as the highest heart rate for the people before they walked up the stairs. This seems to have arisen because candidates took the leaf furthest to the right as having the highest value.

Q8. The most common error in part (a) was to plot the points at the end of each interval rather than at mid-interval. Other errors included joining the points with a curve rather than line segments.

Part (b) was generally well done although some candidates gave the answer as 35 rather than the class interval. Some students also gave the value of the frequency, 16, rather than the class interval.

Part (c) was not as well done as might have been expected.

Q9. Many candidates showed a good understanding of compound interest and gained full marks for this question. Some used a multiplier and some worked out the interest and added it on for each year. The use of multipliers usually led to concise and well presented answers. A few candidates used incorrect multipliers such as 1.32, 1.38 and 1.5. When candidates worked out the compound interest correctly for only one bank it tended to be Northway Bank. A common error for Portland Bank was to work out 5% of 6000 and 3.2% of 6000 and add the two together, instead of finding 3.2% of 6300 for the second year. Some candidates did not know the difference between simple

interest and compound interest and therefore only gained one mark for finding 3.8% of 6000 or 5% of 6000. Errors were sometimes the result of using incorrect (or inefficient) methods for calculating 3.8% and 3.2%. It was pleasing that almost all candidates remembered to make a decision about the best bank, even if they had used an incorrect method.

Q10. This question was well attempted by students and many gained full marks but others, probably due to not reading the information carefully enough were calculating 75% and adding it on. Some students chose to work in cm, which would have been ok had they then converted their answer back to meters but as they did not they lost the accuracy mark. A few stopped one bounce short, however a more common error was to calculate the height after four bounces.

Q11. Most students were able to take a reading from the graph but many of these then failed to work out the amount Tony was paid which resulted in an answer between 310 and 320. Commonly students worked out that he was paid £225 for 500 miles but did not then know to do another reading at 200 miles to complete the process. Another common error was to just look at the reading for one small 2 mm square with 10 miles bringing in £5. Multiplying this by 70 to get £350 did not provide an answer within the given tolerances. Just looking at the reading for one small 2 mm square also affected their answer to part (b) with many not scoring on this part. Those students who used their answer to part (a) tended to work out divided by their answer to (a) getting an amount of £2.20 per mile rather than taking their answer to (a) and dividing it by 700.
A few students wrote an answer of £45 without showing any working which resulted in no marks being scored.

Q12. 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 0.4×10^{-2} rather than 4×10^{-3}

Q13. Many students failed to correctly find the area of the cross section of the bar, usually by incorrectly finding the missing dimensions; $15 \times 2 + 15 \times 2 + 12 \times 2$ (= 84) was a common error. Students successfully finding the area of the cross section usually then found the correct volume. Failure to complete the solution correctly was usually a result of dividing their volume by the density instead of multiplying. Some students used their area of cross section as the volume and failed to gain any further credit. A few students lost the final method and hence the accuracy mark for not correctly converting to the right units.

Q14. In part (a) sight of a complete answer (both 6 and −6) was rare. Some credit was given where an answer was embedded, which was not uncommon. The main mistake occurred when students divided by 2 twice instead of dividing by 2 and then finding the square root.

In part (b) the majority were familiar with what was required but many failed to multiply the $3x$ by $3x$ correctly, often writing this as $6x$, but gained 1 mark if they multiplied their other terms correctly. Using a table format was very popular and generally successful for those students.

In part (c) very few were familiar with the requirements of factorising into two brackets so often tried to "factorise" using only one pair of brackets. Common wrong answers like $x(x + 6) + 9$ were frequently seen.

Q15. 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.

Q16. Best-buy questions are a regular visitor to our papers and though the numbers were not straightforward many candidates were able to make a start on the question either by trying to find the number of grams per penny or pence per gram. Many candidates gained two marks by calculating the small and the medium bottle costs for 1710g. As this is a starred question we were strict on the writing of the calculations we would accept for the second and third method marks. The calculations that could lead to comparative figures for two or three bottles all had to be written in either pounds or in pence, not a mixture. For the award of the final communication mark all answers had to be correct and there needed to be a statement of which bottle was the best value for money.

Q17. The candidates that had the most success with this question were those that adopted an algebraic approach. They had an easy route in with one mark available for using n, $2n$ and 15 added to equal 63. They could then score a second mark for subtracting 15 from each side of their equation. The candidates that used a trial and improvement method usually fell down because they were confused by the 15 and that we wanted to see a logical approach evidenced by at least two pairs of numbers in the ratio 1 : 2. The candidates that tried an intuitive approach by subtracting 15 from 63 usually went wrong because they divided the 48 by 2 and not 3.

Q18. It is encouraging to report that over half of all candidates gave fully correct responses to this question. It was common to see the correct method for each part clearly written in the working space. Where candidates had identified a correct method, some made careless errors.

For example the answer "5.5" was seen often for part (a) and in part (b) candidates often totalled the numbers correctly only to divide their total by 8 or 10 instead of by 9. In working out the mean candidates often omitted brackets and wrote "4 + 8 + 5 + 9 + 10 +5 + 6 + 3 + 4 ÷ 9" instead of the correct "(4 + 8 + 5 + 9 + 10 +5 + 6 + 3 + 4) ÷ 9". When trying to find the median many candidates forgot to order the list before selecting the "middle

number".

A significant minority of candidates were confused between the different statistical measures and it was not uncommon to see the mean worked out for part (a) and the median for part (b).

The range also appeared in some candidates' responses to either part (a) or Part (b).

Q1.

		Working	Answer	Mark	Notes
			1.3852..	2	M1 for 6.4 or 4.62 or $^{320}/_{231}$ A1 for 1.3852(81385)

Q2.

Question		Working	Answer	Mark	Notes
	(a)		positive	1	B1 Accept with 'positive' valid extra words eg strong positive
	(b)		46 – 54	2	B2 46 – 54 Or M1 for a single line segment with positive gradient that could be used as a line of best fit or a vertical line from 44 A1 for given answer in the range 46 – 54

Q3.

Paper_5MB1F_01					
Question		Working	Answer	Mark	Notes
	(a)		13	2	M1 for 18 – 5 or 5 – 18 or a – 5 or 18 – a (where a is score in list $a \neq 18$) or − 13 A1 cao
	(b)		11.5	2	M1 for an attempt to order or for answer 9 Or $\frac{10 + 13}{2}$ or $\frac{5 + 13}{2}$ A1 cao
	(c)		15	2	M1 12 × 7 (=84) or "84" − 69 A1 cao

Q4.

Question		Working	Answer	Mark	Notes
		(2 × 11) + (6 × 23) + (10 × 14) + (14 × 2) = 22 + 138 + 140 + 28 = 328 328 ÷ 50	6.56	4	M2 for use of midpoints accept one error or three of 22, 138, 140, 28 seen or three of 2×11, 6×23, 10×14, 14×2 seen (M1 for use of fw with w consistent within intervals (including end points) accept one error) M1 (**dep** on M1) for use of "Σfw" ÷ 50 or "328" ÷ 50 A1 cao

Q5.

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]

Q6.

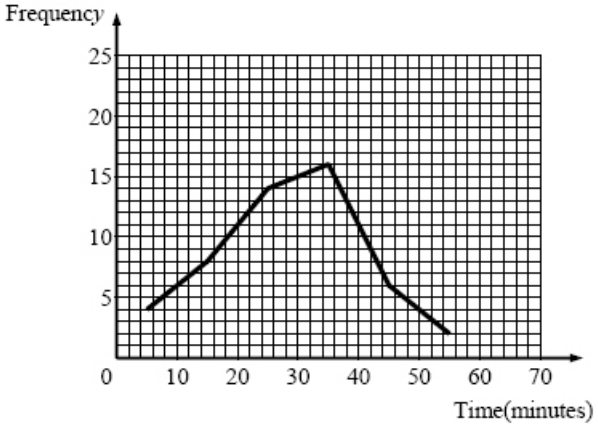
		Working	Answer	Mark	Notes
		$\sqrt{\frac{2.73\ldots}{0.732\ldots}}$	1.931851...	2	M1 for 2.73... or 0.732...or 3.73...or 1.931 or 1.932 or 1.93 or $(1 + \sqrt{3})$ or $(\sqrt{3} - 1)$ or $(2 + \sqrt{3})$ **or** 1.65... **or** 0.855... A1 for 1.9318(5...) SC: B1 for 2.5127(17...)

Q7.

Question	Working	Answer	Mark	Notes
	Median (before) = 67 Median (after) = 78 Mean (before) = 69.6 Mean (after) = 80.8(6...) Range (before) = 84 – 58 = 26 Range (after) = 102 – 65 = 37 IQR (before) = 78 – 61 = 17 IQR (after) = 91– 69 = 22	Comparison of 1. medians / means 2. range / IQR	6	B2 for median (before) = 67 and median (after) = 78 (B1 for one correct median) OR B2 for mean (before) = 69.6 and mean (after) = 80.9 /80.8(6..) (B1 for one correct mean) B2 for range (before) = 26 and range (after) = 37 OR B2 for IQR (before) = 17 and IQR (after) = 22 (B1 for one correct range/IQR) OR B2 for fully correct diagram/chart to compare, e.g. box plots, cumulative frequency diagrams, etc (B1 for diagram/chart with one error in presentation) C1 for median (after) > median (before) oe or ft their medians OR for mean (after) > mean (before) oe or ft their means OR C1 for range (after) > range (before) oe or ft their ranges OR for IQR (after) > IQR (before) oe or ft their IQRs C1 for comments, in context, relating to an average and to the spread of the data (dep on B3). QWC: Decisions should be justified and calculations attributable SC If no marks scored, B1 for a correct comparison (eg Heart rates are faster after walking up the stairs)

Q8.

Question		Working	Answer	Mark	Notes
	(a)		Correct Frequency Polygon	2	B2 Fully correct polygon. Points plotted at the midpoint (B1 All points plotted accurately not joined, **or** one error in plotting but joined **or** all points plotted accurately and joined with, additionally, first joined to last **or** all points at the correct heights and consistently within or at the ends of the intervals **and** joined (Includes joining last to first to make a polygon))
	(b)		$30 < t \leq 40$	1	NB: ignore polygon before 1st point, and after last point. Ignore any histograms.
	(c)	(6 +2) = 8, (4 + 8 + 14 + 16 + 6 + 2) = 50	$\frac{8}{50}$oe	2	B1 Allow any notation eg, 30-40 ft polygon M1 (6 +2)÷ (4 + 8 + 14 + 16 + 6 + 2) **or** ft figures from polygon **or** $\frac{8}{a}$with $a >$ 8 **or** $\frac{c}{50}$ with $c >$50**or** 8 and 50 used but notation incorrect (eg. 8:50 , 8 out of 50) A1 $\frac{8}{50}$oe (eg. 0.16) **or** ft figures from polygon



Q9.

		Working	Answer	Mark	Notes
		Northway Bank: 6000 × 0.038 = 228 6000 + 228 = 6228 6228 × 0.038 = 236.664 6228 + 236.664 = 6464.664 Portland Bank: 6000 × 0.05 = 300 6000 + 300 = 6300 6300 × 0.032 = 201.6 6300 + 201.6 = 6501.6	Portland Bank with values	4	M1 for a correct method to calculate 3.8% or 5% of 6000 M1 for a correct method to calculate using a compound interest method, eg 1.038^2 oe or 1.05 followed by 1.032 oe A1 for 1.077444 or 1.0836 or for 6464.66(4) or 464.66(4) or for 6501.6(0) or 501.6(0) C1 for a correct decision in a statement with two correct comparable values e.g. for 7.7(444)% and 8.36 %, or for 6464.66(4) and 6501.6(0), or for 464.66(4) and 501.6(0) **NB** all final money values can be rounded or truncated to nearest integer or left unrounded

Q10.

5MB3H/01 June 2015				
Question	**Working**	**Answer**	**Mark**	**Notes**
		0.84	3	M2 for 2×0.75^3 (M1 for 2×0.75 (=1.5) or 2×0.25 (=0.5) and 2 – "0.5") A1 for 0.84 – 0.844

Q11.

PAPER: 5MB1F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
	(a)		315	2	M1 for taking a reading from graph A1 for 310 – 320
	(b)		0.45	2	M1 for amount paid ÷ distance travelled, eg 45 ÷ 100 A1 for 0.425 – 0.475 or 42.5p – 47.5p OR M1 for 'part (a)' ÷ 700 A1 ft for 0.425 – 0.475 or 42.5p – 47.5p

Q12.

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

Q13.

Question		Working	Answer	Mark	Notes
			3	5	M1 for a complete method to find the area of the cross section, eg. 15 × 2 + "(12 – 4)" × 2 + 15 × 2 (= 76) or for finding the volume of a relevant prism, eg. 15 × 2 × 120 (= 3600) "(12 – 4)" maybe just seen on the diagram M1 for a method to find the volume of the bar, eg. "76" × 120 (= 9120) or ft "area of cross section"×120 provided "area of cross section" includes a method to find the area of at least **two** relevant rectangles M1 for "volume" × 8, eg. "9120" × 8 (= 72960) or 250 × 1000 ÷ 8 (= 31250) NB "volume" must be dimensionally correct M1 (dep on previous M1) for 250 ÷ ("volume" × 8) ÷ 1000, eg. 250 ÷ "72960 ÷ 1000" (= 3.4265….) or "31250" ÷ "9120" A1 for an answer of 3 with correct working

Q14.

Question	Working	Answer	Mark	Notes
(a)		±6	M1	for one value (6 or −6) or $\sqrt{36}$ or an embedded answer eg $2 \times 6^2 = 72$
			A1	±6
(b)	$6x^2 - 4x + 3x - 2$	$6x^2 - x - 2$	M1	for at least 3 terms correct out of a maximum of 4 from expansion, or 4 terms correct ignoring signs.
			A1	cao
(c)		$(x + 3)^2$	B1	for $(x + 3)^2$ or $(x + 3)(x + 3)$

Q15.

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)

Q16.

		Working	Answer	Mark	Notes
		342 ÷ 88 =3.886… 570 ÷ 195 =2.923… 1500 ÷ 399 =3.759… **or** 88 ÷ 342 =0.257… 195 ÷ 570 =0.342… 399 ÷ 1500 =0.266	small with correct calculations	4	M1 for one of 342 ÷ 88 (=3.886…), 570 ÷ 195 (=2.923…), 1500 ÷ 399 (=3.759…) **or** for one of 88 ÷ 342 (=0.257…), 195 ÷ 570 (=0.342…), 399 ÷ 1500 (=0.266) **or** any other calculations that could lead to a comparative figure M1 for calculations that could lead to comparative figures for 2 bottles M1 for calculations that could lead to comparative figures for 3 bottles e.g. all three from the above list C1 for three correct comparative figures for all 3 bottles, leading to a correctly stated comparison : small or 342g best value

Q17.

		Working	Answer	Mark	Notes
		$x + 2x + 15 = 63$ $3x = 48$	16	3	M1 for $x + 2x + 15 = 63$ M1 for attempt to subtract 15 from each side of their equation A1 cao **or** M1 for 63 – 15 (=48) M1 for '48'÷3 A1 cao **or** M2 for16 and 32 seen (M1 for strategy for finding at least two pairs of marbles that meet the criteria x, $2x$) A1 cao

Q18.

Question		Working	Answer	Mark	Notes
	(a)	3 4 4 5 5 6 8 9 10	5	2	M1 for ordering the 9 numbers A1 cao
	(b)	(4 + 8 + 5 + 9 + 10 + 5 + 6 + 3 + 4)÷9 54 ÷ 9	6	2	M1 for (4 + 8 + 5 + 9 + 10 + 5 + 6 + 3 + 4) ÷ 9 or 54 ÷ 9 A1 cao