"BETWEEN PAPERS" PRACTICE

SET 1 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. Pythagoras' Theorem questions are also firm favourites on these papers and here again candidates did not score as well as they might have done. They made the usual mistakes of doubling instead of squaring, dividing by 2 instead of square rooting, adding the lengths instead of the squares of the lengths and even subtracting the squares of the given lengths. There was some evidence of candidates trying to use scale drawing but these were almost always unsuccessful as the required accuracy of the answer was too great for their drawing.
Q2. Many students scored full marks on this question, others scored M1 for either 98 × 5 or 114 × 7.

The most common error seen was to just multiply any two out of 98, 114 and 162 with no thought to what these might mean. This showed a lack of comprehension of the question asked.

Q3. This was one of the most successfully answered questions on the paper. The great majority of students successfully found and compared the sale price of a watch in both shops rather than the alternative method of comparing the reduction in each shop. Students nearly always gave a clear conclusion at the end of their working.

Q4. The frequency table in part (a) was completed correctly by most students. When one of the frequencies was incorrect it was often the one for dogs. Students could have checked that the sum of their frequencies was 18.

In part (b) the mode was generally well understood. Incorrect answers included 7 (the range of the frequencies) and 45 (the sum of the frequencies).

Q5. It was pleasing to note that over 40% of candidates scored all four marks. Many of those candidates who scored no marks were able to calculate the value of 192.6 or 2692.6 for scheme A, but then failed to negotiate the percentage element of scheme B. Many candidates used a chunking method to find 3% of 2500, mostly with success. Some candidates used a compound interest method correctly and some gained two marks as they then correctly compared both schemes using the same time scale. One common error was for candidates to add £5.35 and 2500, then multiplying this by 36.

Q6. A variety of diagrams were seen. Some candidates insist on joining the first to last points forming an enclosed shape. This may come from their interpretation of the word polygon in this question. Centres should ensure candidates are aware this is not correct when drawing a frequency polygon. Another common error is to plot the heights at the end of the intervals. If candidates did this consistently they were awarded one mark. Some candidates draw the histogram first and then add the frequency polygon, this is an acceptable method and full marks can be awarded.

Q7. Confusion between range and the averages caused problems for candidates in this question. In part (a) 50% found the correct range but others found the difference between the first and last temperatures listed. 6 was a common incorrect answer from incorrect selection of either 10 and 16 or 12 and 18 as the lowest and highest values. A single mark was rarely awarded although 10-18 was occasionally seen.

75% of candidates correctly gave the mode in part (b) with others usually giving an incorrect average. In part (c), about 50% of candidates calculated the correct mean but many gave another average, often the median, instead. Typical errors with calculator use led to an answer of 124.6 and others rounded the final answer to 14. In both cases it was essential for working or a previous answer of 13.9 to be seen for the award of marks.

Q8. Many students had clearly never covered this topic and did not know the meaning of an error interval. Of those students who knew what they were doing failure in giving the correct inequalities prevented full marks being achieved. One mark was often awarded for sight of either 4.755 or 4.765.

It was not uncommon for students to give the difference between the bounds as their final answer, losing the accuracy mark.

Incorrect use of inequality signs (getting them the wrong way around) was also common even when correct endpoints had been identified.

Q9. Answers to parts (a) and (c) were good. Many candidates knew how to expand brackets correctly for part (a). On part (c), many candidates knew they had to add the exponents. Part (b) was answered much less surely, with correct answers rather rare. Some candidates who spotted that y was a common factor then went on to write $y(y + 3y)$.

Q10. This was another well answered question. Most students completed the table of values correctly and went on to plot points accurately in part (b). By far the most common loss of marks was because

students either joined their points with straight line segments or because they did not join them at all. Many students scored full marks.

Q11.A good number of fully correct answers to part (a) were seen. The most common incorrect response was for students to draw a reflection in the *y* axis – this was awarded one mark. A rotation of 180° about (0, 0) was also seen quite frequently but, of course this could not be given any marks. A small proportion of students reflected the shape in the *x* axis.
Over three quarters of students gained at least one mark in part (b). Most students scored the mark for enlargement and a good proportion of students were also awarded the mark for stating a correct scale factor. Fewer students gave the correct centre of enlargement. It was heartening to see that nearly all students described a single transformation rather than a combination of transformations.

Q12. Most students showed they were able to expand the brackets correctly. Many also demonstrated that they could rearrange terms, either by rearranging a *t* term, or by dividing through by a numerical value. Some struggled with sign changes. The final mark was frequently lost when the candidate could not resolve all terms correctly. The final expression did not have to be fully simplified, but candidates did have to write an expression that was algebraically equivalent with the correct answer.

In part (b) clear working out was essential. It was encouraging to see many detailed attempts. Trial and improvement approaches rarely resulted in correct solutions. Substitution methods were equally unsuccessful. Most errors were due to arithmetic mistakes or error in handling negative signs. Most candidates were able to manipulate the equations but processing them was much harder.

Q13. Few candidates were able to find the correct volume of this prism. Many attempted to find the surface area and many tried to find the volume by multiplying the perimeter of the cross section by the length of 20 cm. A significant number did start by finding the volume of one cuboid, usually 1540 (11 × 7 × 20) but failed to complete the task. Among the candidates who attempted to find the area of the cross section, errors included the use of incorrect dimensions (not usually shown on the diagram) or working such as (11 × 4) + (7 × 5).

Q14. In part (a) many students worked out the probability of getting a red counter as 0.05. A common incorrect answer was 0.5, often with 0.95 or 1 – 0.95 shown in the working.

Part (b) asks for the least possible number of counters in the bag. Students are advised to read the question carefully as a surprisingly large number gave a colour, not a number, as the answer. Sometimes they gave the lowest probability. Some students worked out the least possible number of counters as 20 but gave no reason for their answer; they scored one of the two marks. The most common correct reasons given referred to the numbers of counters having to be whole numbers. Some students gave a number greater than 20 as the least possible number of counters but scored one mark for a correct reason.

Q15. It was very pleasing to see that the vast majority of students approached this question by using a two-way table. As a result it was very well done with majority of students gaining full marks. For those students who did not use a table some responses were difficult to follow, with numbers and calculations containing no written explanation as to the category or gender. Some students showed good practice by checking their final solution with the given information.

Q16. A huge variety was seen in this question. There were many fully correct answers. There were some who decided that 117 was the number of tulips planted.

Others divided the remaining people in half. They then used 110 as the angle as well. There was some working out seen but students would have benefitted from showing more working on this style of question. When working was seen 1.1 was often used instead of 1.111.. bringing rounding errors into the final answer.

Q17. The mark for a correct interior angle of the pentagon was often the only mark achieved by many students; other angles were sometimes incorrectly labelled 108°. As usual, many gave 72° as the interior angle. Although many correctly used the properties of the lines of symmetry, which did gain credit, few correctly completed the solution to find the angle *x*. Some students gave 72° as the angle between the two lines of symmetry given.

Q1.

		Working	Answer	Mark	Notes
			26.7	3	M1 for $(GJ^2 =)\ 24.5^2 + 10.6^2$ or 600.25 + 112.36 or 712.61 M1 for $\sqrt{24.5^2 + 10.6^2}$ or $\sqrt{712.61}$ A1 26.69 – 26.7

Q2.

Question		Working	Answer	Mark	Notes
			146	3	M1 for 98 × 5 (=490) or 114 × 7 (=798) M1 for a complete method eg "798" – "490" – 162 (=146) A1 cao

Q3.

PAPER: 5MB3H_01

Question	Working	Answer	Mark	Notes
*		Tymes shop	3	M1 for 80 – 18 (= 62) or for method to reduce 80 by 20% oe (= 80 − 16 = 64) A1 for 62 and 64 C1 for comparison using 62 and 64 OR M1 for method to find 20% of 80 (=16) A1 for 16 C1 for comparison using 16 and given 18 OR M1 for writing £18 as a % of £80 (= 22.5%) A1 for 22.5% C1 for comparison using 22.5% and 20%

Q4.

Question		Working	Answer	Mark	Notes
	(a)		5, 1, 4, 8	2	M1 for at least 2 correct frequencies or 2 correct tallies A1 for all frequencies correct (ignore tally column)
	(b)		dog	1	B1 ft from frequency column or from tally if different to frequency. Accept 8

Q5.

		Working	Answer	Mark	Notes
*			Scheme B gives most	4	M1 for correct method to find 3% of 2500 M1 for correct method to compare Scheme A and Scheme B for the same length of time A1 for correct answers for both schemes C1 f.t. (dep on a comparison for the same length of time) for Scheme B gives the most OR M1 for correct method to convert £5.35 into a % of 2500 M1 for for correct method to compare Scheme A and Scheme B for the same length of time A1 for 2.5(68)(%) C1 f.t. (dep on a comparison for the same length of time) for Scheme B gives the most

Q6.

		Working	Answer	Mark	Notes
			Points plotted at (5, 6), (15, 9), (25, 8), (35, 7), (45,5) and joined with line segments	2	B2 for correct plotting of 5 points and joining with line segments (B1 for points plotted correctly at midpoints of intervals **OR** joining points with line segments at the correct heights and consistent within the class interval (including end values) **OR** correct frequency polygon with one point incorrect **OR** correct frequency polygon with first and last points joined) NB Ignore any histogram drawn and any part of frequency polygon outside range of first and last points plotted

Q7.

Question	Working	Answer	Mark	Notes
(a)	18 – 10	8	2	M1 for 18 – 10 A1 cao [SC: B1 for 10 to 18, 10 – 18, 18 to 10 oe, if M0 scored]
(b)		13	1	B1 cao
(c)	(13+14+12+10+13+16+14+13+18+16) ÷ 10 = 139 ÷ 10	13.9	2	M1 for (13+14+12+10+13+16+14+13+18+16) ÷ 10 allow one error, omission or extra in 10 temperatures, condone missing brackets. A1 cao

Q8.

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

Q9.

		Working	Answer	Mark	Notes
	(a)		$5m + 10$	1	B1 cao
	(b)		$y(y + 3)$	1	B1 cao
	(c)		a^9	1	B1 cao

Q10.

PAPER: 5MB3H_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
(a)		−3 −2 −1 0 1 2 3 −5 **8** 9 **4** **−1** 0 13	2	B2 for all 3 correct values (B1 for 2 correct values)
(b)			2	M1 (dep on B1) for plotting at least 6 values from their table A1 for a correct graph

Q11.

PAPER: 5MB3H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
	(a)		reflection	2	B2 cao (B1 for reflection in vertical line)
	(b)		enlargement sf 2 centre (−6,2)	3	B1 for enlargement B1 for (scale) factor 2 or ×2 B1 for (−6, 2) (NB B0 if not single transformation)

Q12.

Question	Working	Answer	Mark	Notes
(a)	$2a + 2t = 5t + 7$ $2a = 3t + 7$ $2a - 7 = 3t$	$\frac{2a-7}{3}$	3	M1 for expansion of bracket eg $2\times a+2\times t$ or divide all terms by 2 M1 for attempt at rearrangement of t term eg $-2t$ each side; $2a = 3t+?$ but with separate terms. A1 $\frac{2a-7}{3}$ oe but must have one term in t. NB: for $\frac{2}{3}$ accept working to 2 dp: 0.67, 0.66, 2.33 or better
(b)		$x = \frac{2}{3}$ $y = -1\frac{1}{2}$	3	M1 for correct process to eliminate either x or y (condone one arithmetic error) M1 (dep on 1st M1) for correct substitution of their found variable or other acceptable method A1 cao for both $x = \frac{2}{3}$ and $y = -1\frac{1}{2}$ oe SC: B1 for $x = \frac{2}{3}$ or $y = -1\frac{1}{2}$ oe NB: for $\frac{2}{3}$ accept working to 2 dp: 0.67 or 0.66 or better

Q13.

		Working	Answer	Mark	Notes
			1180	3	M1 for a correct method to find the area of the cross section M1 (dep) for a complete correct method for the volume of the prism A1 cao OR M1 for a correct method to find the volume of one cuboid M1 (dep) for a complete correct method for the volume of the prism A1 cao

Q14.

Question	Working	Answer	Mark	Notes
10 (a)		0.05	B1	for 0.05 oe
(b)		20	C1	for stating that at least 20 required
		Reason	C1	for reason eg explains that number of each colour must be a whole number or that there must be (at least) 1 red counter or shows that $0.05 = \frac{1}{20}$

Q15.

Question	Working	Answer	Mark	Notes
		11	4	M1 for a correct first step which results in a value that could be in the table: ie. $66 - 10 - 20$ (= 36) or $66 - 43$ (= 23) or $10 - 4$ (= 6) M1 for correct method to find a second value that could be in the table using their first value eg "23" – 4 - 10 (= 9) or "36" - 10 (= 26) M1 for a fully correct and complete method. A1 cao

	S	A	B	
M	4	9	10	**23**
F	**6**	**11**	**26**	43
	10	20	**36**	66

Q16.

Question		Working	Answer	Mark	Notes
			Tulip 130 Hyacinth 90 81° and 162° sectors	4	M1 for 360 ÷ 400 (= 0.9) or 400 ÷ 360 (= 1.1..) M1 for 117 ÷ "0.9" (=130) or 117 × "1.1.." (=130) or 400 – 180 – 130 (= 90) M1 for "90" × "0.9" (=81) or "90" ÷ "1.1.." (=81) or 180 × "0.9" (=162) or 180 ÷ "1.1.." (=162) A1 2 correct angles drawn on pie chart ± 2° with labels.

Q17

Question		Working	Answer	Mark	Notes
			144	4	M1 for method to find the interior angle of a regular pentagon, eg. 180 × (5 – 2) ÷ 5 (= 108) oe M1 (indep) for using a line of symmetry to find an angle, eg. " interior angle " ÷ 2 (half an interior angle) or 90 between line and side M1 (dep on M2) for complete method to find angle x, eg. 90 + "54" or "108"×5 – "108"×2 – 90×2 A1 for 144 supported by working OR M1 for considering all 5 lines of symmetry or angle vertically opposite x with angle bisector drawn M1 for 360 ÷ 10 (= 36) or 360 ÷ 5 (= 72) M1 for (360 ÷ 10) × 4 or (360 ÷ 5) × 2 A1 for 144 supported by working OR M1 for method to find the exterior angle of a regular pentagon (72°), eg. 360 ÷ 5 (= 72) oe M1 (indep) for using a line of symmetry to find an angle, eg. "interior angle" ÷ 2 (half an interior angle) or 90 between line and side M1 (dep on M2) for complete method to find angle x, eg. 180 – 2(180 – 90 – 72) A1 for 144 supported by working