"Between Papers" Practice

Set 3 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 poorly answered. Many gained 1 mark for finding the area of the circle but finding the area of the square proved to be beyond the majority of students. An incorrect method of 6 × 6 was frequently seen but less understandable on a Higher tier paper was the number of students who worked out 6+6+6+6 or 6×6×6×6 for the area. Some students worked out the area of the square by first finding the area of one of the triangles and some used Pythagoras's theorem to find the side length of the square. Those using Pythagoras sometimes rounded the side length before working out the area of the square and lost accuracy. It is disappointing when students fail to understand that $(\sqrt{72})^2$ gives 72, not 71.9 or a similarly rounded figure. Some students found an area for the square that was greater than the area of the circle and went on to subtract the area of the circle from the area of the square.

Q2. A well answered question in which students preferred to select a value for the motor bike, and then proceeded to show how the depreciation differed for a simple, or compound approach. With a clear comparison at the end this could attract full marks. Lengthy expositions without any mathematical calculation, on the other hand, gained little credit.

Q3.A pleasing 40% of students gained the full 5 marks on this starred question where Quality of Written Communication was being assessed with the very best students clearly well used to presenting their work in a clear structured manner with an explicit concluding statement. Most of the other students were able to carry out the basic operations needed for Investment A to work out the total interest earned after 3 years. With Investment B, however, there were various problems with percentage calculations, with many using a "build up" method for calculating 3.5% rather than having a solid calculator method for calculating percentages. Unless evidence of a fully correct method was seen, part marks were not awarded for such work unless the correct answer was reached.

A common error, perhaps amongst more able students, was to treat Investment B as if compound rather than simple interest was being applied. Students need to be encouraged to check details carefully in such questions and not make assumptions based on similar questions they may have tackled during preparation for a paper.

Q4. The vast majority of candidates were able to score full marks. Some used the full words but obvious abbreviations were also allowed. There were a few responses where the candidate showed a misunderstanding of the nature of the task and gave two starters, for example, as a combination.

Q5. The most successful approach was where students calculated the number of boxes which would fit along the edges of a container. Students who worked out the volume of the box and the volume of the container and then divided one by the other often made errors in their arithmetic or in their conversion of the units used. Completely correct solutions using this method were relatively rare.

Q6. Part (a) was well attempted by most candidates with many scoring full marks. In most cases those who didn't score full marks either wrote an expression containing $4n$ scoring B1 or wrote $n + 4$ scoring B0. There were very few responses seen with other coefficients of n.

Part (b) was well attempted by most candidates though more candidates were successful in part (a). The most common incorrect response was 907, however, those candidates who presented full working out and initially wrote $3 \times 10^2 + 7$ followed by $30^2 + 7$ did earn at least M1, unfortunately in most cases candidates wrote $3 \times 10 = 30$, $30^2 = 900$, $900 + 7 = 907$. Candidates who tried to generate all the terms of the sequence were usually unsuccessful.

Q7. Two thirds of candidates provided the correct answer to part (a) with 5 being the most common incorrect answer. In part (b) 40% of candidates could find the median speed. Many counted the number of cars incorrectly when finding the median hence arriving at 43, 45, 43.5 or 44.5 etc.

Part (c) was well answered with half providing a range of 31. Many confused median with mean and mode. Many candidates did provide the two numbers involved in calculating the range, but either did not know what to do with the two numbers or could not do the subtraction correctly.

Q8. This was a well-answered question. Some candidates deduced the correct order by considering the power of ten associated with the number, while others converted the standard form numbers into ordinary numbers before comparing them. Some confused 10^2 with 10^{-2}. It was often the case that 3800×10^{-4} was in the wrong place, with candidates either thinking the 3800 made it the biggest number, or that the –4 index power made it the smallest.

Q9. The majority of candidates recalled and used the correct area of a circle formula; in nearly all these cases the correct radius was also used. Many forgot to divide by 4 near to the end. Some candidates failed to realise they were asked to work in terms of π and attempted numerical calculation. However, those who were working in terms of π also made many errors, particularly in over-simplifying their answer: $144 - 36\pi = 108\pi$ was not uncommon.

Q10. This question was very poorly answered with few students knowing the formula Volume = Mass/Density. The great majority either multiplied the mass by the density or divided density by the mass. Again conversion between units was poor, many not knowing that 1kg = 1000g.

Q11. This non-standard locus question caught many students unawares. About half of the students shaded the intersection of the two circles rather than more that 10km from *M* and less than 6 km for *N*. About a half of the students gave a fully correct solution.

Q12. This question was answered quite well and about two thirds of candidates scored full marks. Most candidates wrote out multiples of 50 and multiples of 80 in order to find the lowest common multiple – they were generally successful. Examiners were able to give some credit to candidates who showed a clear intention to do this but who made arithmetic errors on the way. Some candidates did not count the first pair of numbers and gave 7 and 4 as their answers. Candidates sometimes converted their times to minutes and seconds. This was unnecessary and made the task more difficult. A significant number of candidates identified 800 as their common multiple and went on to give 16, 10 as their answers. This gained partial credit. Candidates who expressed each of 50 and 80 as a product of prime factors often made no further progress; they could not use this to identify the lowest common multiple and subsequently give a correct solution.

Q13. A fully correct response to this question was not often seen. Many students either did not involve a formula for the circumference of the trundle wheel in their answers or they mistakenly used the formula for the area of a circle. Some students were awarded a mark for using the correct formula but did not consider the number of times the wheel rotated. Answers were not always changed to metres.

Q14. Part (a) was done quite well. Many students were able to write 180 as a product of prime factors- the use of factor trees being by far the most popular approach. Here, as elsewhere, basic arithmetic was an issue for some students, eg 180 written as 2×60 or as 8×20. A common incorrect answer was to write the prime factors as a list of prime factors rather than as a product of prime factors.

Part (b) was not done so well, though many students were able to get 1 mark for writing two numbers with one of the two required properties, ie as having an HCF of 6 or as having a LCM a multiple of 15. Popular incorrect answers, scoring 1 mark, were 30, 60 and 3, 5.

Q15. In part (a) many candidates did not know the meaning of the word 'reciprocal'. A variety of incorrect answers were seen with the most common being 25.Part (b) was poorly answered. The most common incorrect answers were −9 and 0.03. Some candidates with the right idea failed to evaluate 3^{-2} and gave the answer as $\frac{1}{3^2}$

In part (c) Many candidates were able to gain one mark for evaluating $9\times10^4 \times 3 \times 10^3$ as 270 000 000 or as 27×10^7. The difficulty for many was changing their answer to standard form. Many thought 27×10^7 was in standard form and failed to do the final step. Candidates who first converted the numbers in the question to ordinary numbers often ended up with too many or too few zeros. Some evaluated 9×3 incorrectly.

Q16. This question was not well answered. Students frequently worked out $360 \div 5 = 72$, often followed by $180 - 72 = 108$, but then marked the angles in incorrect positions on the diagram and gained no marks. Many errors were seen. These included: using 72° as an interior angle of a regular pentagon; using 108° as an angle in the trapezium or as an exterior angle of the pentagon; using incorrect totals of 720° or 900° for the sum of the angles in a pentagon. Even when they marked 108 in a correct position many students did not know how to use it to find angle *SRC*.

Q17.A surprising number of candidates (9%) scored one mark in this question, either for correctly calculating the missing angles in the isosceles triangle *ABC* or for finding the alternate angle *CAE*. Two marks were obtained for obtaining both angles and this was achieved by 4% of candidates. The 10% of candidates that found the missing angle *x* scored 3 marks but only 0.6% of candidates could state the reasons correctly. Few candidates use the three letter notation to identify angles. Some candidates used Z angles in their explanation which is no longer acceptable for alternate angles.

Q1.

PAPER: 1MA0/2H				
Question	Working	Answer	Mark	Notes
	$\pi \times 6^2 - 2 \times 6 \times 6$	41.1	4	M1 for correct method to work out the area of the circle or quarter circle or semi-circle eg $\pi \times 6^2$ (=113(.09..)); $\pi \times 6^2 \div 2 = 56.5(4..)$; $\pi \times 6^2 \div 4 = 28.2(7…)$) M1 for method to work out the area of the square (=72) oe or a triangle eg ½×6×6 (=18) M1 for complete method to find shaded area. A1 for value in the range 41.04 - 41.112

Q2.

5MB3H_01 November 2015					
Question		Working	Answer	Mark	Notes
*			36% depreciation	3	M1 for 0.8 × 0.8 (=0.64) M1 for 1 – "0.64" (=0.36) C1 for 36% (depreciation) oe or compares cost with 40% reduction OR (uses a trial value, eg 1000) M1 for $1000\times(0.8)^2$ (=640) M1 for (1000 – 640) ÷ 1000 (=0.36) C1 for 36% (depreciation) oe or compares cost with 40% reduction OR M1 for 0.2 × 0.2 (=0.04) M1 for 0.2 + 0.2 – "0.04" (=0.36) C1 for 36% (depreciation) oe or compares cost with 40% reduction OR C1 only for identifying the 2nd 20% reduction is off the reduced amount at the end of the first year

Q3.

Paper: 5MB3F_01					
Question		Working	Answer	Mark	Notes
*			Investment A with working	5	M1 for 8×12(=96) **or** 8×3×12 (=288) M1 for 0.035×2400 (=84) **or** 0.035×2400×3 (=252) M1 for use of the same time period for both calculations eg 8×12(=96) **and** 0.035×2400 (=84) or 8×3×12 (=288) **and** 0.035×2400×3 (=252) A1 for correct answers for same time period eg 96 **and** 84 or 288 **and** 252 C1 (dep on M2) for correct decision based on their figures, supported by working OR M1 for 8×12(=96) **or** 8×3×12 (=288) M1 for $\frac{\text{"96"}}{2400} \times 100$ or for $\frac{\text{"288"}}{2400} \times 100$ (=12) M1 for use of the same time period for comparison eg $\frac{\text{"96"}}{2400} \times 100$ or "12"÷3 compared to 3.5% or $\frac{\text{"288"}}{2400} \times 100$ (=12) compared to 3.5 × 3 (=10.5) A1 for 4(%) or 12(%) **and** 10.5(%) C1 (dep on M2) for correct decision based on their figures, supported by working

Q4.

Question		Working	Answer	Mark	Notes
		(S, L), (S, B), (S, C), (P, L), (P, B), (P, C)	List all 6 choices	2	B2 for all 6 with no extras or repeats (B1 for at least 3 correct)

Q5.

Question		Working	Answer	Mark	
		or	Yes (supported)	4	M1 for attempt to divide corresponding sides eg 500 ÷ 50 (=10) or 250 ÷ 50 (=5) or 200 ÷ 50 (=4) M1 (dep) multiplying divisors eg "10" × "5" × "4" (=200) [consistent units] M1 for use of 3 containers eg "200" × 3 (=600) or use of 500 boxes eg 500 ÷ "200" (=2.5) C1 for yes and 600 (boxes) or 2.5 (containers) oe OR M1 for attempt to find the volume eg 500 × 250 × 200 (=25 000 000) or 50 × 50 × 50 (=125 000) M1 (dep) for dividing volumes [consistent units] eg "25 000 000" ÷ "125 000" (=200) or "125 000" × 500 (=62 500 000) M1 for use of 3 containers eg "25 000 000" × 3 (=75 000 000) or "200" × 3 (=600) or use of 500 boxes eg for "125 000" × 500 (= 62 500 000) and "25 000 000" × 3 (= 75 000 000) or 500 ÷ "200" (=2.5) C1 for yes and 600 (boxes) or 2.5 (containers) or 62 500 000 and 75 000 000 oe

Q6.

		Working	Answer	Mark	Notes
	(a)		$4n - 3$	2	B2 for $4n - 3$ oe (B1 for $4n + k$, $k \neq -3$ or $n = 4n-3$)
	(b)		307	2	M1 for substitution of 10 into $3n^2+7$ $(=3\times10^2+7)$ A1 cao

Q7.

Question		Working	Answer	Mark	Notes
	(a)		6	1	B1 cao
	(b)		44	1	B1 cao
	(c)		31	2	M1 for 60 – 29 **or** 29 – 60 **or** any correct method that is attempting to find the difference between 29 and 60 (allow 1 arithmetic error) A1 cao

Q8.

Question		Working	Answer	Mark	Notes
		0.38×10^{-1}, 3800×10^{-4}, 0.038×10^{2}, 380	Correct order	2	M1 changing any one correctly or at least 3 in the correct order (ignoring one) or reverse order A1 for correct order (accept any form)

Q9.

Question		Working	Answer	Mark	Notes
			36 – 9π	3	M1 for π×6×6 or 36π seen value 113.03-113.2 M1 for (12×12 –'π×6×6')÷4 or value 7.7-7.8 A1 for 36 – 9π oe **OR** M1 for π×6×6÷4 or 9π seen or value 28.2-28.3 M1 for 6×6 – 'π×6×6÷4' or value 7.7-7.8 A1 for 36 – 9π oe NB: for M marks π may be given numerically.

Q10.

Question	Working	Answer	Mark	Notes
		648	M2 [M1 A1	a complete method, eg 12.5 × 1000 ÷ 19.3 for using volume = mass/density, eg 12500 ÷ 19.3 (condone inconsistent units or incorrect conversions) may be implied by digits 647... or 648...] for answer in range 647 to 648

Q11.

Question		Working	Answer	Mark	Notes
			Correct region shaded	3	M1 for a circle centre *M* or *N* (accept arc of sufficient length to define the region) M1 for circle centre M radius 5 cm **and** circle centre *N* radius 3 cm (accept arc of sufficient length to define the region) A1 for correct region shaded

Q12.

		Working	Answer	Mark	Notes
		LCM (80, 50) = 400 Matt 400 ÷ 50 = 8 Dan 400 ÷80 = 5 **OR** 50 = 2 × 5 (× 5) 80 = 2 × 5 (× 2 × 2 × 2)	Matt 8 Dan 5	3	M1 lists multiples of both 80 (seconds) and 50 (seconds) (at least 3 of each but condone errors if intention is clear, can be in minutes and seconds) or use of 400 seconds oe. M1 (dep on M1) for a division of "LCM" by 80 or 50 or counts up "multiples" (implied if one answer is correct or answers reversed) A1 Matt 8 and Dan 5 SC B1 for Matt 7, Dan 4 **OR** M1 for expansion of both 80 and 50 into prime factors. M1 demonstrates that both expansions include 10 oe A1 Matt 8 and Dan 5 SC B1 for Matt 7, Dan 4

Q13.

PAPER: 5MB3H_01					
Question		Working	Answer	Mark	Notes
			43	3	M1 for $\pi \times 40$ or $2 \times \pi \times 20$ M1 for $34 \times 2 \times \pi \times 20$ A1 for 42.7 – 43

Q14.

PAPER: 1MA0_1H					
Question		Working	Answer	Mark	Notes
	(a)		2×2×3×3×5	3	M1 for a continual prime factorisation (at least two consecutive steps correct) or at least two stages of a factor tree correct M1 for a fully correct factor tree or list 2,2,3,3,5 A1 for 2×2×3×3×5 or $2^2×3^2×5$
	(b)		Eg 6, 30	2	M1 for two numbers with an HCF of 6 **or** for two numbers with a LCM a multiple of 15 A1 for two numbers with an HCF of 6 **and** a LCM a multiple of 15 (eg (6, 30), (12, 30), …) **OR** M1 for 2×3 **and** 3×5 **or** for 2×3×5 A1 for two numbers with an HCF of 6 **and** a LCM a multiple of 15 eg (6, 30) (12, 30) …

Q15.

PAPER: 1MA0_1H					
Question		Working	Answer	Mark	Notes
	(a)		$\frac{1}{5}$	1	B1 oe
	(b)		$\frac{1}{9}$	1	B1 cao
	(c)	$9×10^4×3×10^3$	$2.7 × 10^8$	2	M1 $27 × 10^7$ oe or $9×3×10^{4+3}$ A1 cao

Q16.

PAPER: 1MA0/2H				
Question	Working	Answer	Mark	Notes
		126	3	M1 for 180 – (360 ÷ 5) (= 108) or (5 – 2) × 180 ÷ 5 (= 108) M1 for a complete method eg $\frac{360-\text{"108"}}{2}$ or $180-\frac{\text{"108"}}{2}$ A1 cao

Q17.

Question		Working	Answer	Mark	Notes
*		Angle *ACB* = 35° (base angles of an isosceles triangle are equal) (angles in a triangle add up to 180) Angle *CAE* = 35° (alternate angles are equal) *x* = 360 – (100 + 90 + 35) = 135 (angles in a quadrilateral add up to 360°)	135	4	M1 for angle *ACB* = (180 – 110) ÷ 2 or 35 seen M1 for angle *CAE* = angle *ACB* or "35" (this could be marked on diagram) A1 *x* = 135 cao C1 (dep on M1) for alternate angles are equal or allied angles (co-interior angles) are supplementary (add to 180°) AND any one of • (base) or 2 angles of an isosceles triangle are equal oe • angles in a triangle (add up to) 180 • angles in a quadrilateral (add up to) 360° • angles in a pentagon (add up to) 540°