Countdown to your final Maths exam ... part 7 (2019)

Markscheme & Examiners Report

Q1. Part (a) was usually attempted with full marks often awarded. The majority of candidates understood that integer values were required. There were a large number of candidates who either included by 0 and 5 or excluded by 0 and 5, possibly due to an uncertainty in the difference between inclusive and exclusive inequalities.

Part (b) was generally answered well, with candidates reaching a solution of 4.5 and scoring at least one mark. Many candidates continue to replace the inequality sign with a equals sign for solving with too many failing to return to the inequality sign for their final answer or just giving '4.5' and so losing the accuracy mark. The majority of candidates who scored full makes carried out correct algebraic manipulations using inequalities throughout. The most common errors were those who multiplied out correctly (6x−12) but then made a mistake with their algebraic manipulation, e.g. 6x >3; multiplied out incorrectly, e.g. to get 6x−2; or multiplied out correctly (6x−12) but then left their answer as 6x−12>15 or 6x>27

Q2. There remains a lot of confusion about frequency polygons. Weaker candidates confuse them with bar charts, or plot the points at the ends of the interval. Others plot them as if a scatter diagram, without joining the points. What to do at the ends is a further confusion, and some joint the two end points. Candidates who drew a bar chart gained some credit if the midpoints of the top of the bars was indicated, but no credit if the corners were used instead. Candidates who superimposed a polygon on top of the bar chart could get full marks.

Q3. Students were most successful in part (a) and incorrect responses were rare. Of those who did not gain full marks most gained the method mark for correctly expanding the bracket but then failed to correctly do (19 − 12) ÷ 4 usually forgetting to use inverse operations.

Students were less successful in part (b) than in part (a) although many gained full marks for p> 7.5. Those that gained one mark either used '=' rather than '>' or having solved the inequality correctly then wrote p = 7.5 or just 7.5 on the answer line. The weaker candidates subtracted 8 from both sides or unsuccessfully attempted a trial and improvement method and gained no marks.

Students were least successful in part (c) though blank responses were rare and many did gain full marks. Most students were using factorisation to solve the quadratic equation though a few stopped short of the complete method, writing (x − 3)(x + 5) as their final answer, to only gain two marks and few wrote (x + 3)(x − 5) gaining just one mark. Some attempted to use the quadratic formula, though those that did were considerably less successful, often only gaining one mark for the substitution. The weaker candidates tried to solve the quadratic equation by isolating the x, leading to e.g. $x = \frac{15-2x}{x}$ or similar incorrect rearrangements of the quadratic equation.

Q4. The responses to this question were very mixed. When candidates knew how to tackle the question the use of the mid-interval values was very much in evidence but there were still some who used either the upper or the lower values of the class intervals. A significant number of candidates worked out the correct answer but then felt the need to round this to 28 on the answer line or to give the answer as the class interval itself. Those who had shown 28.25 in the working were not penalised for doing this. Some candidates realised that 'fx' could be involved and did the appropriate calculations but then decided not to use these results, choosing instead to divide the total of the frequencies by the number of class intervals (a very common incorrect method) and gaining no marks.

Q5. No Examiner's Report available for this question

Q6. No Examiner's Report available for this question

Q7. A large number of candidates failed to see the significance of the word ' integer' and so gave a fraction or decimal as their final answer. Most candidates were able to reach a value of 3.6 or 3.7 by either solving the equation $3x + 5 = 16$ or dealing correctly with the inequality. Algebraic methods did not have to be used and some candidates, aware of the meaning of integer, simply substituted in integer values of x until the inequality became false.

Q8. On too many occasions the plotting was at the end of the interval, rather than at the midpoint. A few introduced extraneous lines (eg joining the first and the last point). In part (b) only a few gave the frequency instead of the class interval.

Q9. In part (a), writing down the possible values of n was well done with just over half of candidates scoring both marks. About a fifth scored one mark, generally for not including the -2 in their answer. Surprisingly many of the candidates who scored one mark missed out the 0. A number of candidates drew inequalities diagrams as an aid to help them find the values.

In part (b), most candidates scored no marks. The most common error was to just list the integer values whilst some wrote inequalities without any letters. A few candidates either got the inequality signs mixed up or only got one of the signs the correct way and so only scored one mark. Many candidates used n or N rather than x, but were not penalised for this.

Q10. No Examiner's Report available for this question

Q11. Many students taking this paper found part (a) of this question to be straightforward. Common errors included a confusion between the signs $\leq$ and $<$. Some students scored 1 mark because they omitted one of the values required or they included one extra value.

In part (b) of the question a large proportion of students were able to identify $x = 3$ as the critical value but far fewer were able to give the correct inequality, $x > 3$, as their final answer. It was interesting to see that many students gave their (correct) final answer in the form $3 < x$ rather than $x > 3$.

Mark Scheme

Q1.

PAPER: 1MA0_2H					
Question		Working	Answer	Mark	Notes
	(a)		−4, −3, −2, −1, 0	2	B2 for all 5 correct values; ignore repeats, any order (B1 for 4 correct (and no incorrect) values or all 5 correct values and −5)
	(b)		$x > 4½$	2	M1 for an attempt to expand brackets (eg $6\times x - 6\times 2$) or $6x - 12$ or for an intention to divide both sides by 6 as the first step or for $4½$ oe seen A1 for $x > 4½$ oe

Q2.

		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 point joined) NB Ignore any histogram drawn and any part of frequency polygon outside range of first and last points plotted

Q3.

5MB3H/01 June 2015				
Question	Working	Answer	Mark	Notes
(a)		1.75	2	M1 for intention to multiply brackets or for intention to divide all terms by 4 as the first step A1 for 1.75 oe
(b)		p > 7.5	2	M1 for correct method to isolate p or intention to divide all terms by 2 as the first step (condone the use of '=' in method) A1 for $p > 7.5$ oe
(c)		3, -5	3	M2 for $(x - 3)(x + 5)$ (M1 for $(x \pm 3)(x \pm 5)$) A1 cao 3 and –5 OR M1 for $\frac{-2 \pm \sqrt{2^2 - 4\times 1\times -15}}{2\times 1}$ M1 for $\frac{-2 \pm \sqrt{64}}{2}$ A1 for 3 and – 5 cao

Q4.

Question		Working	Answer	Mark	Notes
		5×3+15×8+25×11+35×9+45×9 =1130 1130 ÷ 40	28.25	4	M1 for finding fx with x consistent within intervals (including the end points) allow 1 error M1 (dep) for use of all correct mid-interval values M1 (dep on first M1) for $\Sigma fx \div 40$ or $\Sigma fx \div \Sigma f$ A1 for 28.25 or 28 ¼

Q5.

Question	Working	Answer	Mark	Notes
(a)		14	B1	cao
(b)		330,170	P1 P1 A1	for a correct first step, e.g. 500 – 160 or two integers that add to 500 or two integers (below 500) with a difference of 160 for a complete process to find either f or g for both values

Q6.

Question		Working	Answer	Mark	Notes
			mistakes identified	2	C1 points joined with curve, not line segments C1 points not plotted at mid-points

Q7.

Question		Working	Answer	Mark	Notes
		$3x > 11$ $x > 11/3$ or 3.66.. OR (16 – 5) ÷3 $11/3$ or 3.66..	4	3	M1 $3x > 11$ or $3x > 16 – 5$ or $3x + 5 – 5 > 16 – 5$ A1 $11/3$ or 3.6(66..) or 3.7 (Accept = or ≥ in place of >) B1 ft OR M1 (16 – 5) ÷3 A1 $11/3$ or 3.6(66..) or 3.7 B1 ft

Q8.

Paper_5MB1H_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
(a)		Frequency polygon	2	B2 for fully correct frequency polygon - points plotted at the midpoint (B1 for all points plotted accurately but not joined with straight line segments) **or** all points plotted accurately and joined with last joined to first to make a polygon **or** all points at the correct heights and consistently within or at the ends of the intervals and joined (can include joining last to first to make a polygon) NB: ignore parts of graph drawn to the left of the 1st point or the right of the last point
(b)		$160 < h \leqslant 180$	1	B1 for $160 < h \leqslant 180$ (could be ft from diagram)

Q9.

		Working	Answer	Mark	Notes
	(a)		−3, −2, −1, 0, 1	2	B2 for all 5 values and no others (B1 for 4 correct values and no others or −4, −3, −2, −1, 0, 1 or −3, −2, −1, 0, 1, 2)
	(b)		$-2 \leq x < 4$	2	B2 for $-2 \leq x < 4$ (B1 for $-2 \leq x$ or $x < 4$ or $-2 < x \leq 4$) [Note: accept the use of any letter other than x throughout and ignore any attempt to list integer values]

Q10.

Paper 1MA1: 3H			
Question	**Working**	**Answer**	**Notes**
(a)	(720+408+304 +252)÷50	33.68	M1 for finding 4 products fw consistently within interval (including end points) M1 (dep on 1st M) for $'\Sigma fw \div 50$ A1 cao

Paper 1MA1: 3H			
Question	**Working**	**Answer**	**Notes**
(b)		Manager with reasons	M1 for strategy to compare number of small size sold to number ordered C1 clear comparison that small size is not ¾ and so Jenny is not correct or the manager is correct

Q11.

PAPER: 5MB3H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
	(a)		$-2, -1, 0, 1, 2$	2	B2 for $-2, -1, 0, 1, 2$ (B1 for one error or omission)
	(b)		$x > 3$	2	M1 for isolating either the constant terms or algebraic terms or for $x = 3$ A1 cao