JustMaths

Countdown to your final Maths exam ... part 8 (2017)

Examiners Report & Markscheme

Examiner's Report

Q1. Most candidates made good attempts at this final question. A small number of candidates scored one mark for getting at least one value in the table correct but then not plotting at least five of their points correctly. The most common error in completing the table was to write −5 instead of 5 for the value of y when x was −3.

Most candidates were able to plot their points from the table accurately to gain one mark in part (b). Many went on to draw a correct curve to gain the second mark and in some cases recovered from incorrect values in the table.

Around a third of the candidates scored all four marks with many of the candidates who scored three marks either failing to join their correctly plotted points or joining their points with straight lines.

> **Results Plus: Examiner Tip**
> Candidates should know that a quadratic expression gives rise to a parabola. In part (a), many calculated the y-value to be −5 when x was −3. This resulted in a curve that was clearly not a parabola. This should have alerted candidates to realise they had made an incorrect calculation.

Q2. Most candidates scored at least one mark for their attempts to complete the table of values in part (a).

(−1. 7) was the most common error but full marks were still available in part (b) for accurate plotting and drawing of a smooth quadratic curve. Unfortunately many failed to secure both marks in part (b), usually through drawing a line segment between the points (2, −3) and (3, −3). Some candidates were very lazy in their curve drawing and many curves did not pass through their plotted points accurately enough. In part (c), many candidates chose not to use their graph and solved the quadratic equation by an alternative method. Although the correct solutions here did gain full marks, many made mistakes in the application of their method. It should be noted that for those candidates whose graph was more of a cubic form, ALL solutions (if not fully correct) were required.

Q3. This question was not well answered. The majority of candidates had little idea of the general shapes of the curves detailed in the specification. Curve **A**, $y = x^2 + 4$, was the most successful match. Some candidates did not seem to recognise the equation of the exponential curve and wrote $y = 2x$ instead of $y = 2^x$. Commonly, there were attempts to plot graphs of the given equations, but this approach was not generally successful.

Q4. This question on completing a table of values, plotting a quadratic graph and then using the graph to solve a quadratic equation discriminated very well. Almost all students were able to score at least one or two marks, usually for partially completing the table and plotting their values. In part (b) many students drew straight lines to give a flat topped curve which lead to the loss of a mark. Only the most able students were able to give the correct two solutions to the quadratic equation with many giving the solution to $6 – x – x^2 = 0$ rather than $6 – x – x^2 = 2$

Q5. No Examiner's Report available for this question

Q6. No Examiner's Report available for this question

Q7. Some good answers in this question, with many gaining at least 2 marks.

Q8. Many correct answers to this question. The only common error in completing the table was use of 15 instead of −15. Plotting was good, though an opportunity to correct errors in the table were lost due to the failure to anticipate the correct shape of the graph. There were many errors in joining the points, with many using straight line segments or curves which missed joining the points.

Q9. No Examiner's Report available for this question

Q10. No Examiner's Report available for this question

Q11. Over one third of students recognised the transformation as an enlargment and gave the correct scale factor but correct identification of the centre of enlargement was very rare indeed. Many students lost marks

through giving multiple transformations as answers, mostly in an attempt to give information about the position of the image in the absence of a centre of enlargment. Typically, a translation was described or vector given.

Q12. Many fully correct enlargements were seen and those candidates who didn't get full marks often gained two marks for an enlargement with scale factor 3 but in the wrong position. A substantial number of candidates did not seem to understand the significance of the centre of enlargement. A common wrong answer was to use the centre of enlargement as one of the vertices in the enlarged shape. Candidates using the ray method rather than 'counting squares' sometimes misplaced the vertices through inaccurate line drawing. It was disappointing to see some candidates lose marks through carelessness and be up to half a square out with some of their vertices.

Q13. The most common method used that lead to the correct answer was to enlarge the triangle and then find the area of the enlarged triangle. It was, however, disappointing to see many candidates successfully enlarge the triangle and then fail to find its area. Those candidates who started with the area of the given triangle invariably divided by 2 rather than $(2)^2$ to find the area of the enlarged triangle. It was very rare indeed to see the area scale factor being used. Equally disappointing was the number of candidates who tried and failed to find the correct area of the given triangle. A significant number of students who drew the enlarged triangle did not understand that a scale factor of ½ would result in a smaller triangle.

Mark Scheme

Q1.

		Working	Answer	Mark	Notes
	(a)		5, −4, −3	2	B2 for 5, −4 and −3 (B1 for 5 or −4 or −3)
	(b)		correct curve	2	B2 for fully correct curve (B1 ft for at least 5 points plotted correctly)

Q2.

PAPER: 5MB3H_01				
Question	Working	Answer	Mark	Notes
(a)	x −1 0 1 2 3 4 5 y 9 3 −1 −3 −3 −1 3	9, −3, −1	2	B2 for a fully correct table of values (B1 for at least one correct extra entry)
(b)		Correct graph	2	B1 (dep on at least B1 in (a)) for all of their points correctly plotted B1 (dep on previous B1) for smooth curve through all 7 of their points
(c)		0.7, 4.3	2	B1 for an answer rounding to 0.7 or ft their graph B1 for an answer rounding to 4.3 or ft their graph

Q3.

		Working	Answer	Mark	Notes
			A and $y = x^2+4$ B and $y = x^3$ C and $y = 2^x$	3	B3 for all correct (B2 for 2 correct) (B1 for 1 correct)

Q4.

Question		Working	Answer	Mark	Notes
	(a)		0, 6, 4, –6	2	B2 for all values correct (B1 for any one value correct)
	(b)		Graph drawn	2	M1 ft (provided B1 in (a) for at least 6 points plotted correctly from their table A1 cao for correct curve drawn from (–4, –6) to (3, –6)
	(c)		1.5 to 1.6 and –2.5 to –2.6	2	M1 for correct use $y = 2$ (may be implied by one correct estimate) or correct use of formula. A1 for 1.5 to 1.6 and –2.5 to –2.6

Q5.

Paper 1MA1: 2H			
Question	Working	Answer	Notes
(a)		(1, 4)	B1
(b)		–0.4, 2.4	B1
(c)		3.75	B1 accept 3.7 – 3.8

Q6.

Question	Working	Answer	Notes
a		$\frac{1}{4}$	M1 For $\frac{x}{24}$ with $x < 24$ or $\frac{6}{y}$ with $y > 6$ A1 for $\frac{6}{24}$ oe
b		PP PM PW MM MW WW	M1 At least 3 correct combinations A1 Fully correct list with no extras or permutations

Q7.

5MB1H/01 June 2015				
Question	**Working**	**Answer**	**Mark**	**Notes**
		A: $y = 2^x$ B: $y = 10 - 2x$ C: $y = 8x - 2x^2$	3	B1cao B1cao B1cao

Q8.

PAPER: 1MA0_2H				
Question	**Working**	**Answer**	**Mark**	**Notes**
(a)		-15, 0, 3, 0 ,-3, 0, 15	2	B2 for all correct (B1 for any 2 or 3 correct)
(b)		Correct graph	2	M1 for at least 5 points plotted correctly (ft from table if at least B1 awarded in (a)) A1 for a fully correct curve

Q9.

Paper 1MA1:3H			
Question	**Working**	**Answer**	**Notes**
		168	M1 product of 14 and 12 A1 cao

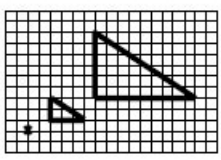
Q10.

Paper 1MA1: 3H			
Question	**Working**	**Answer**	**Notes**
(a)	Number of men possible is 17 Number of women possible is 26 Each man can be paired with 26 different women 17 × 26	442	P1 Process to find number of combinations A1
(b)		Ben with reason	C1 Convincing reason eg. correct calculation is 17 × 16 ÷ 2

Q11.

Paper: 5MB3F_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
			enlargement scale factor 3 centre *O*	3	B1 for enlargement B1 for scale factor 3 B1 for (centre) *O* oe NB: B0 for any combination of transformations

Q12.

		Working	Answer	Mark	Notes
				3	B3 for fully correct triangle (B2 for 2 vertices correct or enlargement scale factor 3 in wrong position or enlargement, centre *A*, with different scale factor) (B1 for 1 vertex correct or enlargement, not from *A*, different scale factor)

Q13.

Question		Working	Answer	Mark	Notes
		½ × 4 × 3 = 6 $(½)^2$ × 6 =	1.5	3	M1 for ½ × 4 × 3 oe M1 for $(½)^2$ × "6" A1 cao **OR** M2 for ½ × 2 × 1.5 oe (M1 for triangle with all lengths ½ corresponding lengths of triangle *ABC* seen in any position **or** vertices seen at (1, 1) (3,1) and (2.5, 2.5) or stated) A1 cao