Countdown to your final Maths exam ... part 4 (2019)

Markscheme & Examiners Report

Q1. No Examiner's Report available for this question

Q2. No Examiner's Report available for this question

Q3. Many students were able to use their calculator to work out the value of the calculation and get 2300000. These students scored at least one mark, but many of them were not then able to write the number in standard form, or perhaps failed to notice that this was the requested form of the answer. But it was also evident that a significant minority of students did not use a calculator. Common incorrect answers here were 23×10^5 and 2.3×10^{12}. Few students wrote down the intermediate steps showing 2645000000 and 1150. A common misconception was that the number of zeros equates to the index number resulting in 2.3×10^5 as the most common incorrect answer.

Q4.In part (a), many candidates did not know what was meant by 'factorise'. A popular incorrect answer was $15t$. Some candidates did not appreciate that both the $3t$ and the 12 needed to be divided by 3. Common incorrect answer here was $3(t + 12)$ and $3(t + 9)$.

In part (b), many candidates did not appreciate that to expand a bracket they needed to multiply both terms in the bracket by the number outside. Common incorrect expansions were $14x + 1$ and $6x + 3$. Some candidates attempted incorrectly to 'simplify' inside each brackets before expanding them, ie $7(2x + 1)$ became $7 \times 3x$ and $6(x + 3)$ became $6 \times 3x$. A significant number of candidates, having reached the correct expansion $14x + 7 + 6x + 18$, did not then go on to simplify this correctly. Common incorrect answers were $14x + 15$ and $45x$ (by 'simplifying' $20x + 25$).

Q5. Also a good discriminator, there were some completely correct solutions to this geometry question and where a solution was not complete, it was often possible for examiners to award partial credit to students who had made some progress.

The most common error made was in the calculation of the size of angle *PTR*. Some students worked out the size of the angle *QRD* then stated that angle *PTR* was the same size. This was without foundation as there was no indication that the line *PT* was parallel to the line *QR*.

Q6. No Examiner's Report available for this question

Q7. No Examiner's Report available for this question

Q8. No Examiner's Report available for this question

Q9. No Examiner's Report available for this question

Q10. Many failed to attempt this question, which is regrettable, since some of the diagram was accessible to all. The first mark was given to anyone who found a simple angle of many: this included some worked out from angles on a straight line or at a point. No reasoning was required: many chose to write on the diagram provided. However, it was important for candidates to identify which angles they were referring to in their working. A second angle could be worked out using properties of parallel lines, which then led to the required angle. There were a number of different routes of solution open to candidates, all of which could attract credit.

Q11. 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.

Q12. No Examiner's Report available for this question

Q13. No Examiner's Report available for this question

Q14. No Examiner's Report available for this question

Q15. No Examiner's Report available for this question

Mark Scheme

Q1.

Question	Working	Answer	Mark	Notes
(a)		3 in Q	B1	the figure 3 is correctly placed
		6 in middle	B1	the figure 6 is correctly placed
(b)		$\frac{7}{11}$	M1	for writing $7/a$ ($a \neq 11$, $a > 7$) or $b/11$ ($b \neq 7$, $b < 11$) (ft)
			A1	for 7/11 (cao or ft from their Venn diagram) oe

Q2.

Paper 1MA1: 1F			
Question	**Working**	**Answer**	**Notes**
		x^2+2x-3	M1 starts expansion: at least 3 terms correct with signs, or four terms correct ignoring signs A1 for x^2+2x-3

Q3.

Question	Answer	Mark	Mark scheme	Additional guidance
	2.3×10^6	M1	for 2.3×10^n where $n \neq 6$ **or** 23×10^5 or 2300000 **or** 2645000000 and 1150 seen	2300000 could be written as 2.3 million
		A1	cao	

Q4.

		Working	Answer	Mark	Notes
	(a)		$3(t + 4)$	1	B1 for $3(t + 4)$ or $3 \times (t + 4)$ oe
	(b)	$14x + 7 + 6x + 18$	$20x + 25$	2	M1 for $7 \times 2x + 7 \times 1$ or $14x + 7$ or $6 \times x + 6 \times 3$ or $6x + 18$ A1 for $20x + 25$ (accept $5(4x + 5)$)

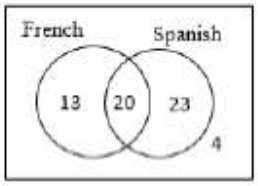
Q5.

Question		Working	Answer	Mark	Notes
			88	4	M1 for (APT =) $180 - (32 + 90)$ (= 58) M1 for (PTR =) "58" M1 for $360 - (\text{"58"} + 124 + 90)$ A1 cao OR (line XY drawn through Q parallel to AB) M1 for (QRD =) $180 - 124$ (= 56) M1 for (XQR =) "56" M1 for (PQX =) 32 A1 cao

Q6.

Question	Working	Answer	Notes
a		$y(y+27)$	B1
b		t^6	B1
c		w^5	B1

Q7.

Question		Working	Answer	Mark	Notes
	(a)		Correct diagram	3	B1 13 and 20 in correct positions M1 43 − 20 (= 23) or 60 − 43 − 13 (= 4) A1 correct diagram
	(b)		$\frac{4}{60}$	1	B1 $\frac{4}{60}$ oe or ft Venn diagram for $\frac{"4"}{60}$

Q8.

Question	Working	Answer	Mark	Notes
(a)		26730	B1	cao
(b)		7.04×10^{-2}	B1	cao
(c)		1.5×10^8	M1	for 150 000 000 or 1.5×10^n where $n \neq 8$
			A1	cao

Q9.

Question	Working	Answer	Mark	Notes
(a)		$2a^2 + 14a$	B1	cao
(b)		$7(2b - 1)$	B1	cao
(c)		13	M1	for correct expansion of the bracket, or for intention to divide both sides by 9 as the first step
			A1	cao
(d)		$12y^5$	B1	cao

Q10

Question	Working	Answer	Mark	Notes
	BFD = 42° *GFB* = 110° 110 − 42	68	3	M1 for *EDC*=42 or *DHF*= 180–110 (=70) M1 for 180 − 42 − 70 A1 cao **OR** M1 for *BFD* = 42° or *BFH* = 110° M1 for 110 − 42 A1 cao **OR** M1 for *AFH* = 180 – 110 (=70°) M1 for 180 − 70 − 42 A1 cao

Q11.

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°

Q12.

Question	Working	Answer	Notes
(a)		$4x + 6y$	M1 for $4x$ or $6y$ A1 for $4x + 6y$ or $2(2x + 3y)$
(b)		$5(2x - 3)$	B1 cao
(c)		4	M1 for method to isolate terms in p on one side and constants on the other side A1 cao

Q13.

Paper 1MA1: 1F			
Question	Working	Answer	Notes
		152	M1 Start to method $ABD = 38°$ **and** BAD or DBC or $DCB = 38°$ M1 ADB or $BDC = 180 - 2 \times 38$ (= 104) A1 for 152 with working

Q14.

Paper 1MA1:3F			
Question	Working	Answer	Notes
		Venn diagram	M1 for two overlapping and labelled ovals M1 for 2 and 6 in the intersection M1 for 5 and 7 in the universal set only C1 for a fully correct Venn Diagram

Q15.

Question		Working	Answer	Mark	Notes
			No with explanation	2	C1 for expansion of $(x + 5)^2$ with at least 3 terms correct or substitution of the same number into both expressions C1 No with $(x + 5)^2 = x^2 + 10x + 25$ or No with correct evaluation of both expressions