MARK SCHEME for the May/June 2015 series

0580 MATHEMATICS

0580/21

Paper 2 (Extended), maximum raw mark 70

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Abbreviations

cao	correct answer only
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- dep dependent
- FT follow through after error
- isw ignore subsequent working
- oe or equivalent
- SC Special Case
- nfww not from wrong working
- soi seen or implied

Question.	Answer	Mark	Part Marks
1	9.5	1	
2	7.37 or 7.371	1	
3	2.7×10^5	1	
4	$2x^2 + 8x - 35$ final answer	2	B1 for 2 correct terms in final answer or M1 for $2x^2 + 3x$ or $5x - 35$
5	Sammy and correct reason with 25.7% oe shown	2	B1 for 25.7% or 0.257 seen or conversion of 26% to fraction and common denominator
6	44	2	B1 for 75.5 or 119.5 seen
7	$24u^2w^3$ final answer	2	B1 for 2 correct elements in final answer
8	13.6 or 13.60	3	M2 for $\sqrt{(-4-7)^2 + (6-(-2))^2}$ oe or M1 for $(-4-7)$ oe or $(6-(-2))$ oe
9	$\frac{9}{5}$	B1	or $\frac{63}{35}$
	their $\frac{9}{5} \times \frac{7}{3}$ or $\frac{9 \times 7}{5 \times 3}$	M1	or <i>their</i> $\frac{63}{35} \div \frac{15}{35}$ or equivalent division with fractions with common denominators
	$\frac{21}{5}$ or $4\frac{1}{5}$ cao	A1	
10	2520	3	M2 for $12 \times (1+6) \div 2$ oe or M1 for 1 area correct
			If zero scored B1 for top speed = 720 m per min or total time = 360 sec

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Qu	estion.	Answer	Mark	Part Marks
11	(a)	4 <i>n</i> oe final answer	1	
	(b)	$3n^2 + 8$ oe final answer	2	M1 for a quadratic expression as final answer or $3n^2 + 8$ oe in working
12		18	3	M2 for $2(2+4)^2 = p(-2+4)^2$ oe
				M1 for $p = \frac{k}{(q+4)^2}$ A1 for $k = 72$
13		72	3	M2 for $\frac{1280}{64} \times \frac{60 \times 60}{1000}$ M1 for working out distance \div speed e.g. figs $1280 \div 64$ or figs $\frac{1280}{their speed}$ or for working out km/h to m/s conversion e.g. $64 \times \frac{1000}{60 \times 60}$ oe or their $\left(\frac{1280}{64}\right) \times \frac{60 \times 60}{1000}$ oe
14	(a)	a + 2b - a or $a - (a - 2b)$ oe	1	
	(b)	Parallelogram	1	
		<i>PM</i> equal and parallel to QR or <i>PM</i> or <i>PS</i> parallel to QR and <i>MR</i> found = a so 2 pairs of parallel sides	1	SC1 for answer trapezium with reason PM parallel to QR
15		<i>y</i> < 8	1	
		$y \ge 6 - x$ oe and $y \ge x + 2$ oe	3	B2 for either $y \ge 6 - x$ oe or $y \ge x + 2$ oe or SC2 for $y = 6 - x$ oe and $y = x + 2$ oe or SC1 for $y \ge 6 - x$ or $y = 6 - x$ or $y \ge x + 2$ or $y = x + 2$

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Qu	estion.	Answer	Mark	Part Marks
16		1597 cao	4	B3 for 1597.39 or 1597.3[9] or 1597.4 or 6597
				or B2 for 6597.3[9] or 6597.4
				or B1 for $5000 \left(1 + \frac{2}{100}\right)^{14}$
				If B1 scored
				B0 scored and an attempt at compound interest is shown SC1 for <i>their</i> 6597[] – 5000 evaluated correctly provided answer positive and SC1 for <i>their</i> final answer rounded correctly to nearest \$ from their more accurate answer
17	(a)	2×3×5	2	B1 for 2, 3, 5 as prime factors
	(b)	90	2	B1 for 90 <i>k</i> or for listing multiples of each up to 90 or $2 \times 3^2 \times 5$
18		Correctly equating one set of coefficients	M1	
		Correct method to eliminate one variable	M1	Dependent on the coefficients being the same for one of the variables Correct consistent use of addition or subtraction using their equations
		<i>x</i> = 0.8	A1	If zero scored SC1 for
		<i>y</i> = -3	A1	2 values satisfying one of the original equations or
				if no working shown, but 2 correct answers given
19	(a)	7.5	2	M1 for $[10] \times \frac{6}{8}$ oe
	(b)	12 cao	2	M1 for $9 \times \frac{8}{6}$ or $9 \times \frac{10}{their (a)}$
20	(a)	(p+t)(y+2x) final answer	2	B1 for $y(p+t)+2x(p+t)$ or y(y+2x)+t(y+2x)
	(b)	7(h+k)(h+k-3) final answer	2	p(y+2x)+i(y+2x) B1 for $7((h+k)^2 - 3(h+k))$ or $(h+k)(7(h+k)-21)$

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Que	estion.	Answer	Mark	Part Marks
21		285 cao	4	M1 for $\frac{1}{3} \times \pi \times 4^2 \times 9$, 48π
				M1 for $\frac{1}{2} \times \frac{4}{3} \times \pi \times 4^3$, $\frac{128\pi}{3}$
				A1 for 284.8 to 284.9, $\frac{272\pi}{3}$
				If A0 then B1 for <i>their</i> final answer rounded correctly to nearest whole number from their more accurate answer dependent on at least M1
22	(a)	$\begin{pmatrix} 22 & 17 \\ 18 & 7 \end{pmatrix}$	2	M1 for a 2×2 matrix with 2 correct elements
	(b)	$\frac{1}{2} \begin{pmatrix} 4 & -3 \\ -6 & 5 \end{pmatrix}$	2	M1 for $\frac{1}{2} \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ or $k \begin{pmatrix} 4 & -3 \\ -6 & 5 \end{pmatrix}$ soi
				or det = 2 soi
23	(a)	-13	1	
	(b)	-3x - 1 or $5 - 3(x + 2)$	1	
	(c)	9x - 10 cao	2	M1 for $5 - 3(5 - 3x)$
	(d)	$\frac{5-x}{3}$ final answer oe	2	M1 for correct first step e.g.
				$y + 3x = 5$ or $\frac{y}{3} = \frac{5}{3} - x$ or $y - 5 = -3x$ or
				better
				or
				for interchanging x and y, e.g. $x = 5 - 3y$, this does not need to be the first step