CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

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
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	$\dfrac{9}{5}$	**B1**	or $\dfrac{63}{35}$
	their $\dfrac{9}{5} \times \dfrac{7}{3}$ or $\dfrac{9 \times 7}{5 \times 3}$	**M1**	or *their* $\dfrac{63}{35} \div \dfrac{15}{35}$ or equivalent division with fractions with common denominators
	$\dfrac{21}{5}$ or $4\dfrac{1}{5}$ 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

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

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Question.	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 $5000\left(1+\dfrac{2}{100}\right)^{14}$ If **B1** scored or **B0** scored and an attempt at compound interest is shown **SC1** for *their* 6597[...] – 5000 evaluated correctly provided answer positive and **SC1** for *their* final answer rounded correctly to nearest \$ from their more accurate answer
17 (a)	$2 \times 3 \times 5$	**2**	**B1** for 2, 3, 5 as prime factors
(b)	90	**2**	**B1** for 90k or for listing multiples of each up to 90 or $2 \times 3^2 \times 5$
18	Correctly equating one set of coefficients Correct method to eliminate one variable $x = 0.8$ $y = -3$	**M1** **M1** **A1** **A1**	 Dependent on the coefficients being the same for one of the variables Correct consistent use of addition or subtraction using their equations If zero scored **SC1** for 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 $[10] \times \dfrac{6}{8}$ oe
(b)	12 cao	**2**	**M1** for $9 \times \dfrac{8}{6}$ oe or $9 \times \dfrac{10}{their\ \textbf{(a)}}$
20 (a)	$(p+t)(y+2x)$ final answer	**2**	**B1** for $y(p+t)+2x(p+t)$ or $p(y+2x)+t(y+2x)$
(b)	$7(h+k)(h+k-3)$ final answer	**2**	**B1** for $7\big((h+k)^2 - 3(h+k)\big)$ or $(h+k)(7(h+k)-21)$

Question.	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 *their* 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

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