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

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2015 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

® IGCSE is the registered trademark of Cambridge International Examinations.

CAMBRIDGE
International Examinations

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	$\frac{9}{5}$ *their* $\frac{9}{5} \times \frac{7}{3}$ or $\frac{9 \times 7}{5 \times 3}$ $\frac{21}{5}$ or $4\frac{1}{5}$ cao	**B1** **M1** **A1**	or $\frac{63}{35}$ or *their* $\frac{63}{35} \div \frac{15}{35}$ or equivalent division with fractions with common denominators
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

© Cambridge International Examinations 2015

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 $p = \frac{k}{(q+4)^2}$ **A1** for $k = 72$
13	72	3	**M2** for $\frac{1280}{64} \times \frac{60 \times 60}{1000}$ **M1** for working out distance ÷ speed e.g. figs $1280 \div 64$ or figs $\frac{1280}{\text{their speed}}$ 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** + 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 $y = x + 2$

© Cambridge International Examinations 2015

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 $5000\left(1+\frac{2}{100}\right)^{14}$ 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)	$2\times3\times5$	**2**	**B1** for 2, 3, 5 as prime factors
(b)	90	**2**	**B1** for 90*k* or for listing multiples of each up to 90 or $2\times3^2\times5$
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
	$x = 0.8$	**A1**	If zero scored **SC1** for 2 values satisfying one of the original equations or if no working shown, but 2 correct answers given
	$y = -3$	**A1**	
19 (a)	7.5	**2**	**M1** for $[10]\times\frac{6}{8}$ oe
(b)	12 cao	**2**	**M1** for $9\times\frac{8}{6}$ oe or $9\times\frac{10}{\textit{their}}$ **(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 $7\left((h+k)^2-3(h+k)\right)$ or $(h+k)(7(h+k)-21)$

© Cambridge International Examinations 2015

Question.	Answer	Mark	Part Marks
21	285 cao	**4**	**M1** for $\frac{1}{3}\times\pi\times4^2\times9$, 48π **M1** for $\frac{1}{2}\times\frac{4}{3}\times\pi\times4^3$, $\frac{128\pi}{3}$ **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

© Cambridge International Examinations 2015