

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
nfw	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	$\frac{9}{5}$ <i>their</i> $\frac{9}{5} \times \frac{7}{3}$ 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 <i>their</i> $\frac{63}{35} \div \frac{15}{35}$ 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

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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 $\div$ 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 <i>their</i> $\left(\frac{1280}{64}\right) \times \frac{60 \times 60}{1000}$ oe
14 (a)	$a + 2b - a$ or $a - (a - 2b)$ oe	1	
(b)	Parallelogram	1	
	PM equal and parallel to QR	1	SC1 for answer trapezium with reason PM parallel to QR
	or PM or PS parallel to QR and MR found = a so 2 pairs of parallel sides		
15	$y < 8$	1	
	$y \geq 6 - x$ oe and $y \geq x + 2$ oe	3	B2 for either $y \geq 6 - x$ oe or $y \geq x + 2$ 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	<p>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 $5000\left(1 + \frac{2}{100}\right)^{14}$</p> <p>If B1 scored or 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</p>
17 (a)	$2 \times 3 \times 5$	2	B1 for 2, 3, 5 as prime factors
(b)	90	2	<p>B1 for $90k$ or for listing multiples of each up to 90 or $2 \times 3^2 \times 5$</p>
18	<p>Correctly equating one set of coefficients</p> <p>Correct method to eliminate one variable</p> <p>$x = 0.8$</p> <p>$y = -3$</p>	<p>M1</p> <p>M1</p> <p>A1</p> <p>A1</p>	<p>Dependent on the coefficients being the same for one of the variables Correct consistent use of addition or subtraction using their equations</p> <p>If zero scored SC1 for 2 values satisfying one of the original equations or if no working shown, but 2 correct answers given</p>
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 $9 \times \frac{10}{\text{their (a)}}$
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	<p>B1 for $7((h+k)^2 - 3(h+k))$ or $(h+k)(7(h+k) - 21)$</p>

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Question.	Answer	Mark	Part Marks
21	285 cao	4	<p>M1 for $\frac{1}{3} \times \pi \times 4^2 \times 9$, 48π</p> <p>M1 for $\frac{1}{2} \times \frac{4}{3} \times \pi \times 4^3$, $\frac{128\pi}{3}$</p> <p>A1 for 284.8 to 284.9, $\frac{272\pi}{3}$</p> <p>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</p>
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	<p>M1 for $\frac{1}{2} \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ or $k \begin{pmatrix} 4 & -3 \\ -6 & 5 \end{pmatrix}$ soi</p> <p>or $\det = 2$ soi</p>
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	<p>M1 for correct first step e.g.</p> <p>$y + 3x = 5$ or $\frac{y}{3} = \frac{5}{3} - x$ or $y - 5 = -3x$ or</p> <p>better</p> <p>or</p> <p>for interchanging x and y, e.g. $x = 5 - 3y$, this does not need to be the first step</p>