CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0580 MATHEMATICS

0580/22 Paper 2 (Extended), maximum raw mark 70

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

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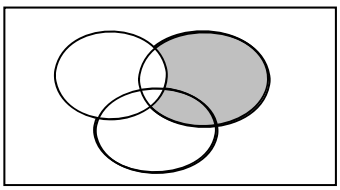
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Abbreviations

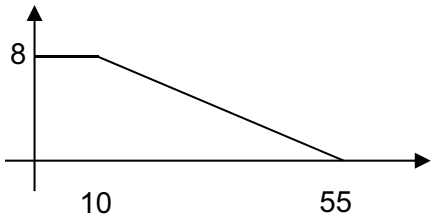
cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
nfww not from wrong working
soi seen or implied

Question	Answer	Mark	Part Marks
1	17	**1**	
2	Parallelogram	**1**	
3	694 or 694.4[4...]	**2**	**M1** for 950 ÷ 1.368
4	5.83 or 5.830 to 5.831	**2**	**M1** for $\sqrt{(-3)^2+5^2}$
5	262 or 261.7 to 261.83…	**2**	**M1** for $\frac{1}{2}\times\frac{4}{3}\pi\times5^3$ If zero scored **SC1** for final answer 524 or 523.5 to 523.7
6 (a)	18	**1**	
(b)		**1**	
7	$\begin{pmatrix} 11 & -8 \\ -6 & 8 \end{pmatrix}$	**2**	**B1** for two correct elements
8	3826 or 3826.38	**2**	**M1** for $8000\times\left(1-\frac{10}{100}\right)^7$ oe
9	0.3	**2**	**M1** for $\frac{k\times50\,000\times50\,000}{100\,000\times100\,000}$ oe If zero scored **SC1** for figs 3
10	54	**3**	**M2** for $14.4\times\frac{15}{4}$ oe or **M1** for $14.4\div4$ or $\frac{4}{15}$ associated with 14.4 If zero scored **SC1** for final answer 19.6[4]

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11	6.24 or 6.244 to 6.245	**3**	**M2** for $\sqrt{8^2 - 5^2}$ or **M1** for $8^2 = 5^2 + x^2$ or better
12	$2\frac{3}{12}$ or $1\frac{15}{12}$ or $\frac{27}{12}$ or $\frac{9\times3}{4\times3}$ *their* $(\frac{27}{12} - \frac{11}{12} = \frac{16}{12})$ oe $1\frac{1}{3}$ or $\frac{4}{3}$ cao	**M1** **M1** **A1**	Accept any correct conversion with common denominator $12k$ Correct resolving of *their* subtraction with denominator $12k$ showing full working Working and then simplified answer must both be seen
13	8.12 or 8.118…	**3**	**M2** for $\frac{12.4}{\sin 74}\times\sin 39$ or **M1** for implicit version $\frac{\sin 39}{y} = \frac{\sin 74}{12.4}$ oe
14	2500 nfww	**3**	**M2** for $2475 \div \left(1 - \frac{1}{100}\right)$ oe or **M1** for 2475 associated with 99%
15 (a)	$(3w+10)(3w-10)$ final answer	**1**	
(b)	$(m+n)(p-6q)$ oe final answer	**2**	**B1** for $p(m+n) - 6q(m+n)$ oe or $m(p-6q) + n(p-6q)$ oe
16	36.8 or 36.80 to 36.81	**3**	**M1** for $\frac{26}{360}\times2\times\pi\times15$ **M1** for 2×15 + a term involving π
17	175	**3**	**M1** for $y = k(x-1)^2$ oe **A1** for $k = 7$ or **M2** for $\frac{63}{(4-1)^2} = \frac{y}{(6-1)^2}$ oe
18	16.2 16.6 nfww	**3**	**M1** for two of 2.35, 5.75, 2.45, 5.85 seen or $2 \times (5.8 - 0.05 + 2.4 \quad 0.05)$ or $2 \times (5.8 + 0.05 + 2.4 + 0.05)$ **A1** 16.2 or 16.6 in either answer space If zero scored **SC2** for both correct reversed answers provided 16.6 nfww

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19		$\sqrt{(-6)^2 - 4(5)(-3)}$ or better seen	**B1**	If completing the square **B1** for $\left(x - \frac{3}{5}\right)^2$ oe
		if $\frac{p+\sqrt{q}}{r}$ or $\frac{p-\sqrt{q}}{r}$ seen then $p = -(-6)$ and $r = 2 \times 5$	**B1**	**B1** for $\frac{3}{5} + \sqrt{\frac{3}{5} + \left(\frac{3}{5}\right)^2}$ or $\frac{3}{5} - \sqrt{\frac{3}{5} + \left(\frac{3}{5}\right)^2}$ oe
		–0.38 1.58 cao final answers	**B1** **B1**	If B0, **SC1** for – 0.4 and 1.6 or – 0.379[795..] and 1.579[795..] or – 1.58 and 0.38 as final answers or – 0.38 and 1.58 seen in working
20	**(a)**		**B1** **B1**	line from (0, 8) to (10, 8) line from *their* (10, 8) to (55, 0)
	(b)	260	**3FT**	**M2FT** for $8 \times 10 + 0.5 \times 8 \times 45$ oe or for a fully correct area calculation for *their* graph or **M1FT** for 8×10 or $0.5 \times 8 \times 45$ or for one correct area calculation for *their* graph
21	**(a)**	12	**2**	**M1** for $\frac{7.2}{x} = \frac{15}{25}$ oe or better eg $7.2 \times \frac{25}{15}$
	(b)	12.8	**3**	**M2** for $16 \times \sqrt[3]{\frac{192}{375}}$ oe or **M1** for $\sqrt[3]{\frac{192}{375}}$ or $\sqrt[3]{\frac{375}{192}}$ oe or $\left(\frac{16}{y}\right)^3 = \frac{375}{192}$ oe
22	**(a)**	3.5 nfww	**3**	**M1** for Σfx soi **M1** (dep) for ÷ 24
	(b)	2 nfww	**3**	**M2FT** for $\frac{\textit{their}\,84 + x}{25} = 3.44$ or better or **M1** for 25×3.44

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23	**(a)**	$\frac{8}{14}$ and $\frac{5}{13}$	**1**	
		$\frac{6}{13}$ and $\frac{7}{13}$	**1**	
	(b) **(i)**	$\frac{30}{182}$ oe	**2**	**M1FT** for $\frac{6}{14} \times$ *their* $\frac{5}{13}$
	(ii)	$\frac{126}{182}$ oe	**3**	**M2FT** for $1 - \frac{8}{14} \times \frac{7}{13}$ or $\frac{6}{14} \times \frac{5}{13} + \frac{6}{14} \times \frac{8}{13} + \frac{8}{14} \times \frac{6}{13}$ or $\frac{6}{14} + \frac{8}{14} \times \frac{6}{13}$ oe or **M1FT** for sum of any two of $\frac{6}{14} \times \frac{5}{13}$ or $\frac{6}{14} \times \frac{8}{13}$ or $\frac{8}{14} \times \frac{6}{13}$

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