

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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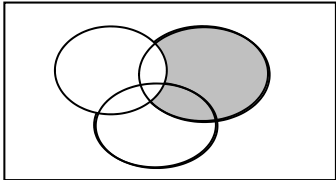
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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0580	22

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 $950 \div 1.368$
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 $\frac{1}{2} \times \frac{4}{3} \pi \times 5^3$ 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 $\frac{k \times 50\,000 \times 50\,000}{100\,000 \times 100\,000}$ oe If zero scored SC1 for figs 3
10	54	3	M2 for $14.4 \times \frac{15}{4}$ oe or M1 for $14.4 \div 4$ or $\frac{4}{15}$ associated with 14.4 If zero scored SC1 for final answer 19.6[4]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0580	22
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 $\frac{9 \times 3}{4 \times 3}$ <i>their</i> $(\frac{27}{12} - \frac{11}{12} = \frac{16}{12})$ oe $1\frac{1}{3}$ or $\frac{4}{3}$ cao	M1 M1 A1	Accept any correct conversion with common denominator $12k$ Correct resolving of <i>their</i> 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 nfw	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 $\frac{26}{360} \times 2 \times \pi \times 15$ M1 for $2 \times 15 +$ 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 nfw	3	M1 for two of 2.35, 5.75, 2.45, 5.85 seen or $2 \times (5.8 - 0.05 + 2.4 - 0.05)$ 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 nfw

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0580	22
19	$\sqrt{(-6)^2 - 4(5)(-3)}$ or better seen if $\frac{p + \sqrt{q}}{r}$ or $\frac{p - \sqrt{q}}{r}$ seen then $p = -(-6)$ and $r = 2 \times 5$ -0.38 1.58 cao final answers	B1 B1 B1 B1	If completing the square B1 for $\left(x - \frac{3}{5}\right)^2$ oe 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 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 <i>their</i> (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 <i>their</i> graph or M1FT for 8×10 or $0.5 \times 8 \times 45$ or for one correct area calculation for <i>their</i> 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 nfw	3	M1 for Σfx soi M1 (dep) for $\div 24$
(b)	2 nfw	3	M2FT for $\frac{\text{their } 84 + x}{25} = 3.44$ or better or M1 for 25×3.44

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0580	22

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 $\frac{6}{14} \times \textit{their} \frac{5}{13}$
	(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 $\frac{8}{14} \times \frac{6}{13}$