UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

0580 MATHEMATICS

0580/21 Paper 2 (Extended), maximum raw mark 70

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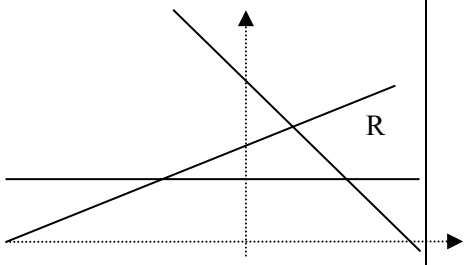
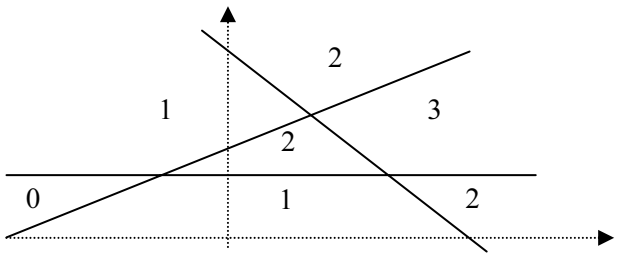
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Abbreviations

cao correct answer only
cso correct solution only
dep dependent
ft follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
www without wrong working
soi seen or implied

Qu	Answers	Mark	Part marks
1 (a)	9486000	**1**	
(b)	9.486×10^6	**1ft**	
2	495.36	**2**	**M1** for $700 \div 1.4131$
3	$3p(5p + 8t)$ final answer	**2**	**B1** for answer of $3(5p^2 + 8pt)$ or $p(15p + 24t)$ **or SC1** for correct answer seen in working
4	$\tan 25 < \sqrt{0.22} < 0.47 < \frac{8}{17}$	**2**	**M1** correct conversion to decimals 0.466, 0.469, 0.471
5	23.2	**2**	**M1** for $\sin 53.2 = \frac{x}{29}$ implicit form or better
6	7	**2**	**M1** $\frac{8+4+8+9+y}{5} = 7.2$ oe
7	30.7975 cao	**2**	**M1** 6.35 **and** 4.85 seen
8	9	**2**	**M1** $125 = 5^3$
9 (a)	angle of 67° at B	**1**	**B1** C marked on AD unless the line stops at AD and also correct ruled line
(b)	perpendicular bisector of AB	**2**	**B1** correct arcs **B1** correct ruled line
10	843.75	**3**	**M2** for $\frac{750 \times 5 \times 2.5}{100} + 750$ oe **or M1** for $\frac{750 \times 5 \times 2.5}{100}$ oe **or SC2** for answer 93.75

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11	$x = -7$ $y = 9$	**3**	**M1** for consistent multiplication and addition/ subtraction as appropriate. Allow computational errors **A1** for $x = -7$ **or** $y = 9$
12	$\frac{55}{30} + \frac{27}{30}$ oe **or** (1)$\frac{25}{30} + \frac{27}{30}$ oe $\frac{82}{30}$ oe **or** (1)$\frac{52}{30}$ oe $2\frac{11}{15}$ **M2** must be scored	**M1** **M1** **A1**	for denominator of $30k$ for denominator of $30k$ dependent on previous **M1** If **M0** scored then **SC1** for common denominator of $30k$ seen
13	1.92	**3**	**M1** $y = \frac{k}{x^2}$ oe **B1** for $k = 48$
14		**3**	
15 (a)	34.4	**2**	**SC1** figs 344 seen
(b)	300	**2**	**SC1** figs 3 seen
16 (a)	$\begin{pmatrix} -1 & 2 \\ 11 & 30 \end{pmatrix}$	**2**	**B1** any two entries correct
(b)	$\frac{1}{26}\begin{pmatrix} 4 & -2 \\ 3 & 5 \end{pmatrix}$ oe	**2**	**B1** $\frac{1}{26}\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ or $k\begin{pmatrix} 4 & -2 \\ 3 & 5 \end{pmatrix}$
17	$w = \frac{4 - 3c}{c - 1}$ www	**4**	**M1** clearing denominator and removing brackets **M1** correctly collecting terms in w on one side only **M1** factorising correctly **M1** divide by coefficient of w
18 (a)	0.8	**1**	
(b)	1850	**4**	**M1** for area = distance travelled **M1** for two correct area statements **M1** for complete correct area statement

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19	**(a)**	$-\mathbf{p} + \mathbf{t}$	**1**	
	(b)	$\mathbf{p} + 2\mathbf{t}$	**2**	**M1** for a correct route from P to R or unsimplified answer
	(c)	$2(\mathbf{p} + \mathbf{t})$ or $2\mathbf{p} + 2\mathbf{t}$	**2ft**	**M1** for **OR** or a correct route or ft **p** + their (b) unsimplified provided their (b) is a vector
20		64.8 to 64.9	**6**	**M2** 5 tan 78 soi by 23.5 or **M1** tan 78 = $\frac{PT}{5}$ or $\frac{5}{\tan 12}$ or $\frac{5\sin 78}{\sin 12}$ **M2** $\frac{360-2\times 78}{360}\times 2\times\pi\times 5$ soi by 17.8 **or M1** for $2\pi 5$ seen used **M1** for their arc + 2 (their *PT*)
21	**(a)**	$\frac{1}{12}$	**2**	**M1** $\frac{3}{3+2+4}\times\frac{2}{(their\ 9)-1}$
	(b)	$\frac{5}{18}$	**3**	**M2** $their(a)+\frac{4\times 3}{their 72}+\frac{2(\times 1)}{their 72}$ **or M1** $\frac{4\times 3}{their 72}$ or $\frac{2(\times 1)}{their 72}$
	(c)	$\frac{5}{9}$	**3**	**M2** $2\times\frac{4}{3+2+4}\times\frac{5}{(their 9)-1}$ **or M1** $\frac{4}{3+2+4}\times\frac{5}{(their 9)-1}$

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