

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

**MARK SCHEME for the October/November 2014 series****0580 MATHEMATICS****0580/21**

Paper 2 (Extended), maximum raw mark 70

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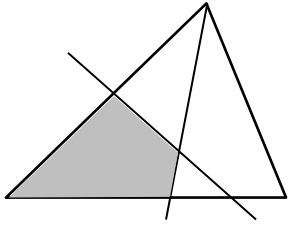
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**Abbreviations**

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

<b>Qu.</b>	<b>Answers</b>	<b>Mark</b>	<b>Part Marks</b>
<b>1</b>	8.1722 cao	<b>2</b>	<b>B1</b> for 8.17 or 8.172 or 8.1721 or 8.17215...
<b>2</b>	3 3.14 $\pi$ 3.142 $\frac{22}{7}$	<b>2</b>	<b>B1</b> for 3.141[5...] to 3.1416 <b>and</b> 3.1428 to 3.1429 or 3.143 seen or <b>SC1</b> for 4 in correct order
<b>3 (a)</b>	E B A cao	<b>1</b>	
<b>(b)</b>	Z cao	<b>1</b>	
<b>4 (a)</b>	-3	<b>1</b>	
<b>(b)</b>	4	<b>1FT</b>	FT their numerical mode
<b>5</b>	$\frac{3}{12}$ and $\frac{2}{12}$ $\frac{5}{12}$ cao	<b>M1</b> <b>A1</b>	Equivalent denominators can be used, working <b>must</b> be shown.
<b>6 (a)</b>	15.1 cao	<b>1</b>	
<b>(b)</b>	20 cao	<b>1</b>	
<b>7</b>	2.5[0] or 2.501... nfw	<b>3</b>	<b>M2</b> for $2.1 \times \left(1 + \frac{6}{100}\right)^3$ oe or <b>M1</b> for $2.1 \times \left(1 + \frac{6}{100}\right)^n$ oe where $n \geq 2$ or for figs $21 \times \left(1 + \frac{6}{100}\right)^3$ oe
<b>8</b>	0.29 cao	<b>3</b>	<b>M2</b> for 30 (24 × 1.2378) or (24 × 1.2378) 30 or <b>M1</b> for 24 × 1.2378
<b>9 (a)</b>	280	<b>1</b>	
<b>(b)</b>	$5 \times 10^6$	<b>2</b>	<b>B1</b> for 5 000 000 oe or <b>B1</b> for answer $k \times 10^6$ or $5 \times 10^k$

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10	3.75 oe	3	M2 for $3 \times 5 - 7x - 3x$ oe or M1 for $3(x+5) - 7x$ or $x+5 - \frac{7}{3}x$ or $1 + \frac{5}{x} - \frac{7}{3}$ or better
11 (a)	$x^6$	1	
(b)	$\frac{x^2}{3}$	2	B1 for answer $kx^2$ or $\frac{x^k}{3}$ or $\frac{1}{3}$
12	$\frac{5}{5}$ nfw	3	M1 for correctly eliminating one variable A1 for $x = 5$ A1 for $y = -5$  If zero scored SC1 for correct substitution and evaluation to find the other variable
13	$[\pm] 8$ nfw	3	M1 for $y = k\sqrt{x+5}$ A1 for $k = [\pm] 2$ or M2 for $\frac{4}{\sqrt{1+5}} = \frac{y}{\sqrt{11+5}}$ oe
14	$\begin{pmatrix} 4 & 16 \\ 2 & 8 \end{pmatrix}$	3	M2 for $\begin{pmatrix} 12 & 48 \\ 6 & 24 \end{pmatrix}$ and $\begin{pmatrix} 8 & 32 \\ 4 & 16 \end{pmatrix}$ or M1 for $\begin{pmatrix} 12 & 48 \\ 6 & 24 \end{pmatrix}$ or for $\begin{pmatrix} 8 & 32 \\ 4 & 16 \end{pmatrix}$
15 (a) (i)		2	B2 for correct ruled bisector with correct arcs or B1 for correct bisector with no/incorrect arcs
(ii)		2	B2 for correct ruled bisector with correct arcs or B1 for correct bisector with no/incorrect arcs
(b)		1	correct shading
16	142 or 142.0...	5	B1 for $CBD = 30$ M2 for $[\sin D] \frac{6 \times \sin \text{their} B}{8}$ oe or M1 for $\frac{6}{\sin D} = \frac{8}{\sin(\text{their} 30)}$ oe A1 for $[D =] 22$ or 22.0 or 22.02... B1FT for $90 + (\text{their} 30 + \text{their} 22)$ evaluated correctly for their final answer or for $360 - 90 - \text{their} BCD$ evaluated correctly for their final answer

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17	890 or 890.1 to 890.2...	5	<p><b>M4</b> for <math>\frac{1}{2} \times \left( \frac{4}{3} \times \pi \times 5^3 \right) + \pi \times 5^2 \times 8</math></p> <p>or <b>M3</b> for <math>\frac{1}{2} \times \left( \frac{4}{3} \times \pi \times 5^3 \right)</math> and <math>\pi \times 5^2 \times 8</math></p> <p>or <b>M2</b> for <math>\frac{1}{2} \times \left( \frac{4}{3} \times \pi \times 5^3 \right)</math> or <math>\pi \times 5^2 \times 8</math></p> <p>or <b>M1</b> for <math>\frac{4}{3} \times \pi \times 5^3</math></p>
18 (a)	0.6 0.2 0.8 in correct places	2	<p><b>B1</b> for 0.6 in correct place</p> <p><b>B1</b> for 0.2 and 0.8 in correct places</p>
(b)	0.52 oe nfw	3	<p><b>M2FT</b> for <math>1 - (\text{their } 0.6 \times \text{their } 0.8)</math> oe</p> <p>or <b>M1FT</b> for a correct product from <i>their</i> tree in (a)</p>
19 (a)	CBA and BDA are equilateral oe	1	
(b)	67[.0] or 67.02 to 67.03	2	<p><b>M1</b> for <math>\frac{120}{360} \times \pi \times 8^2</math> oe</p>
(c) (i)	39.3 or 39.28 to 39.33	3	<p><b>M2FT</b> for <i>their</i>(b) <math>\frac{1}{2} \times 8^2 \times \sin 120</math> oe</p> <p>or <b>M1</b> for <math>\frac{1}{2} \times 8^2 \times \sin 120</math> oe</p>
(ii)	78.6 or 78.7 or 78.56 to 78.66	1FT	<p><b>FT</b> <math>2 \times \text{their(c)(i)}</math> correctly evaluated</p>
20 (a)	0.4 or $\frac{2}{5}$	2	<p><b>B1</b> for <math>[f(2) =] 4</math></p> <p>or <b>M1</b> for <math>\frac{2}{(3x - 2) + 1}</math> or better</p>
(b)	-0.8 or $\frac{4}{5}$	2	<p><b>M1</b> for <math>2 - 10(x + 1)</math> or better</p>
(c)	$3x - 6$ or $3(x - 2)$ nfw	3	<p><b>M2</b> for <math>3(2x) - 2 - (3(x + 2) - 2)</math></p> <p>or <b>M1</b> for <math>[f(2x) - 2] - 3(2x) - 2</math> or</p> <p><math>[f(x + 2)] - 3(x + 2) - 2</math></p>