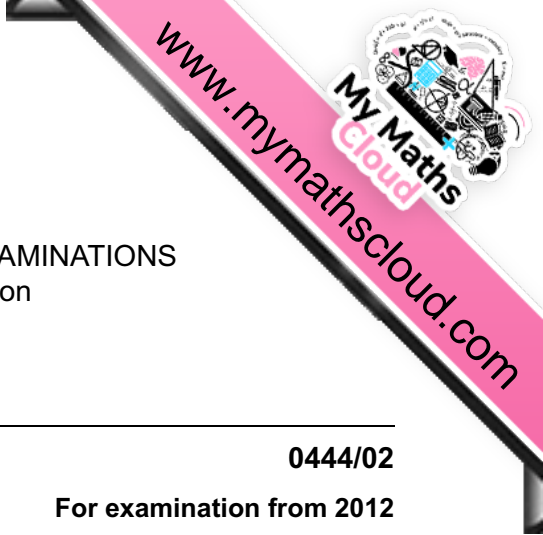




UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education



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**CAMBRIDGE IGCSE MATHEMATICS (US)**

**0444/02**

Paper 2 (Extended)

**For examination from 2012**

SPECIMEN SCORING GUIDE

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**MAXIMUM SCORE: 70**

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This document consists of **4** printed pages.

### Types of score

**M** scores are given for a correct method.

**A** scores are given for an accurate answer following a correct method.

**B** scores are given for a correct statement or step.

**D** scores are given for a clear and appropriately accurate drawing.

**P** scores are given for accurate plotting of points.

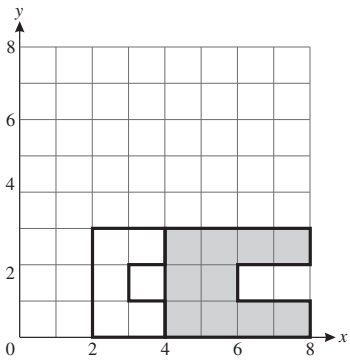
**E** scores are given for correctly explaining or establishing a given result.

**SC** scores are given for special cases that are worthy of some credit.

### Abbreviations

cao	correct answer only
cso	correct solution only
ft	follow through
isw	ignore subsequent working
oe	or equivalent
soi	seen or implied
ww	without working
www	without wrong working

<b>1 (a)</b>	any non-square $\sqrt{\quad}$ or $\pi$ or $e$	<b>B1</b>	$\sqrt{5}$ but not $\sqrt{9}$ , $\sqrt{2}/3$ is OK, $\sin 20$ etc but not $\sin 30$ No fractions, decimals, or negatives
<b>(b)</b>	61 or 67	<b>B1</b>	allow 61 <b>and</b> 67 but no other pairs [2]
<b>2</b>	20	<b>B2</b>	<b>M1</b> for $2.5 \div 0.125$ oe [2]
<b>3 (a)</b>	35 500	<b>B1</b>	<b>B1</b> for $16 \times 10^{14}$ or 1 600 000 000 000 000 oe [4]
<b>(b)</b>	$6.9 \times 10^{-3}$	<b>B1</b>	
<b>(c)</b>	$1.6 \times 10^{15}$	<b>B2</b>	
<b>4 (a) (i)</b>	1	<b>B1</b>	<b>B1</b> <b>B1</b> <b>B1</b> [3]
<b>(ii)</b>	6 (or -6)	<b>B1</b>	
<b>(b)</b>	7	<b>B1</b>	
<b>5 (a)</b>	$\frac{12}{18}$ oe	<b>B1</b>	Accept equivalent fractions, decimals, % but not ratio. isw cancelling/conversion
<b>(b)</b>	$\frac{3}{12}$	<b>B2</b>	<b>B1</b> for any fraction over 12 [3]
<b>6 (a)</b>	570	<b>B1</b>	<b>B1</b> [2]
<b>(b)</b>	Neptune	<b>B1</b>	

<p><b>7 (a)</b></p> <p><b>(b)</b></p>	<p><math>4x^2 - 7x - 7x + 49</math> or better</p> <p><math>3y(x + 2y)(x - 2y)</math></p>	<p><b>B2</b></p> <p><b>B2</b></p>	<p><b>B1</b> for any 3 of these terms seen in work</p> <p><b>B1</b> for <math>3y(x^2 - 4y^2)</math> or <math>(x - 2y)(3xy + 6y^2)</math> or <math>(x + 2y)(3xy - 6y^2)</math> or better seen</p> <p>[4]</p>
<p><b>8 (a)</b></p> <p><b>(b)</b></p>	<p>36</p> <p>126</p>	<p><b>B2</b></p> <p><b>B2</b></p>	<p><b>M1</b> for <math>2 \times 2 \times 3 \times 3</math> oe</p> <p><b>M1</b> for <math>2 \times 3 \times 3 \times 7</math> oe</p> <p>[4]</p>
<p><b>9 (a)</b></p> <p><b>(b)</b></p>	<p><math>x &lt; 3.5</math> oe</p> <p>ft their <b>inequality</b> from (a)</p>	<p><b>B2</b></p> <p><b>B1 ft</b></p>	<p><b>M1</b> for 3.5 oe seen or <math>4x &lt; 14</math> seen</p> <p>[3]</p>
<p><b>10 (a)</b></p> <p><b>(b)</b></p> <p><b>(c)</b></p>	<p>Plots (65, 20), (80, 15) and (60, 25) correctly</p> <p>Negative</p> <p>ft their reading at 50 hot drinks from a ruled line of best fit</p>	<p><b>P2</b></p> <p><b>B1</b></p> <p><b>B2 ft</b></p>	<p><b>P1</b> for 2 plots correct</p> <p><b>B1</b> for attempt to read at 50 without line of best fit</p> <p>[5]</p>
<p><b>11 (a)</b></p> <p><b>(b)</b></p>	<p>Rotation (only)</p> <p><math>90^\circ</math> counterclockwise oe about the origin (0, 0) oe</p> 	<p><b>B1</b></p> <p><b>B1</b></p> <p><b>B1</b></p> <p><b>P2</b></p>	<p>If <b>P0</b>, <b>P1</b> for stretch y-axis invariant line scale factor <math>k &gt; 0</math> (<math>k \neq 1</math>), or for stretch x-axis invariant line scale factor 2, or for any horizontal translation of the correct solution</p> <p>[5]</p>
<p><b>12</b></p>	<p><math>a = 4, b = 2</math></p>	<p><b>B1 B1</b></p>	<p>[2]</p>
<p><b>13 (a)</b></p> <p><b>(b)</b></p>	<p><math>\begin{pmatrix} 12 \\ 1 \end{pmatrix}</math></p> <p><math>\sqrt{20}</math> oe</p>	<p><b>B2</b></p> <p><b>B2</b></p>	<p><b>B1</b> for either correct</p> <p>If <b>B0</b> award <b>M1</b> for <math>(\pm 4)^2 + 2^2</math> or better seen</p> <p>[4]</p>

<b>14 (a)</b>	$y = -2x + 4$ oe	<b>B2</b>	After <b>B0</b> , <b>B1</b> for $y = mx + 4$ ( $m \neq 0$ ) or for $y = -2x + c$
<b>(b)</b>	slope of perp = $\frac{1}{2}$ midpoint = (1, 2) $2 = \frac{1}{2} \times 1 + c$ $y = \frac{1}{2}x + \frac{3}{2}$ or any correct equivalent	<b>B1</b> <b>B1</b> <b>M1</b> <b>A1</b>	For substituting correctly into the equation of a line formula. <b>M1</b> can imply <b>B1 B1</b> if correct
			[6]
<b>15 (a) (i)</b>	Sketches $x + y = 5$	<b>B1</b>	Line with negative slope with intercepts in positive $x$ and $y$
<b>(ii)</b>	Sketches $y = 1$	<b>B1</b>	Horizontal line with $y = 1$ indicated
<b>(iii)</b>	Sketches $y = 2x$	<b>B1</b>	Positive slope passing through 0
<b>(b)</b>	Writes $R$ in correct region	<b>B1</b>	
			[4]
<b>16 (a)</b>	$\sqrt{3}$	<b>B1</b>	not $\frac{\sqrt{3}}{1}$
<b>(b)</b>	$14\sqrt{3}$	<b>B2</b>	<b>B1</b> for $10\sqrt{3}$ or $4\sqrt{3}$ seen
<b>(c)</b>	$8 + 2\sqrt{15}$ or $2(4 + \sqrt{15})$	<b>B2</b>	<b>M1</b> for $5 + \sqrt{15} + \sqrt{15} + 3$ or $\sqrt{25} + \sqrt{15} + \sqrt{15} + \sqrt{9}$
			[5]
<b>17 (a)</b>	$c = 19, d = 3$	<b>B3</b>	<b>B1</b> for $d = 3$ or <b>M1</b> for $(x + 3)^2 - 9 + c = (x + d)^2 + 10$
<b>(b)</b>	10	<b>B1</b>	
			[4]
<b>18 (a)</b>	$wf = 300\,000$ oe	<b>B2</b>	<b>M1</b> $wf = k$ and <b>A1</b> $k = 300\,000$
<b>(b)</b>	500	<b>B1</b>	
			[3]
<b>19 (a)</b>	$24\pi$ www  $\text{cm}^3$	<b>B2</b>  <b>B1</b>	Condone $24 \times \pi$ <b>M1</b> for $\frac{\pi \times 9 \times 8}{3}$ or $\frac{\pi \times 3^2 \times 8}{3}$ Independent units mark
<b>(b)</b>	436	<b>B2</b>	<b>M1</b> for 4 or $2^2$ seen as scale factor
			[5]