

**MARK SCHEME for the October/November 2013 series**

**0580 MATHEMATICS**

**0580/21**

Paper 2 (Extended), maximum raw mark 70

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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**Abbreviations**

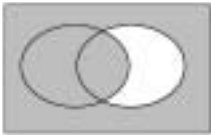
- cao correct answer only
- cso correct solution only
- dep dependent
- ft follow through after error
- isw ignore subsequent working
- oe or equivalent
- SC Special Case
- www without wrong working

Qu.	Answers	Mark	Part Marks
1	86.7 or 86.74 to 86.75	1	
2	5.293 cao	2	<b>B1</b> for 5.29 or 5.292 to 5.2927
3	125	2	<b>B1</b> for 55 or 125 in any other correct position on diagram or <b>M1</b> for 180–55
4	7.7	2	<b>M1</b> for $44 \times \frac{17.5}{100}$ oe
5	4.8 oe	2	<b>M1</b> for $5 + 19 = 3x + 2x$ oe or better or <b>B1</b> for $24 - 2x = 3x$ oe or $5 = 5x - 19$ oe
6	(a) $\frac{2}{6}$ oe  (b) 200	1  <b>1FT</b>	  FT $600 \times$ <i>their</i> (a) providing <i>their</i> (a) is a probability
7	435, 445 cao	2	<b>B1</b> for one value in the correct place or <b>SC1</b> for both values correct but reversed
8	134	3	<b>M2</b> for $\frac{20.1 \times 100}{3 \times 5}$ oe or <b>M1</b> for $\frac{x \times 3 \times 5}{100} = 20.1$ or $3\% = 4.02$ oe  If 0 scored <b>SC1</b> for answer of figs 134
9	(a) $\frac{n}{n+2}$ oe final answer  (b) $n^2-1$ oe final answer	1  2	  <b>B1</b> for any quadratic in final answer
10	$[\pm]\sqrt{c^2 - a^2}$ oe final answer	3	<b>M1</b> for correct square <b>M1</b> for correct re-arrangement <b>M1</b> for correct square root

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<b>11</b>	150	<b>3</b>	<b>M1</b> for $m^3$ to $cm^3$ or $cm^3$ to $m^3$
<b>12</b>	(a) 110 (b) 79	<b>1</b> <b>2</b>	<b>B1</b> for $DAC = 42$ or $ACB = 79$ or $ACD = 28$
<b>13</b>	(a) $\frac{5}{4}$ oe (b) $4y^6$	<b>1</b> <b>2</b>	<b>B1</b> for $ky^6$ or $y^6$ or $4y^k$ or 4 as final answer
<b>14</b>	$\frac{2t-5}{t-1}$ final answer	<b>3</b>	<b>B1</b> for $\frac{3(t-1)}{t-1}$ or better <b>B1</b> for $3(t-1) - (t+2)$ oe or better
<b>15</b>	(a) $\frac{9}{12} - \frac{1}{12}$ oe [=] $\frac{8}{12}$ oe [=] $\frac{2}{3}$ (b) $\frac{5}{2} \times \frac{4}{25}$ oe Cancelling shown or $\frac{20}{50}$ oe [=] $\frac{2}{5}$	<b>M1</b> <b>M1</b> <b>M1</b> <b>M1</b>	Must be shown Both fractions must be shown Must be shown <b>Dependent</b> and cancelling shown or a fraction and then $\frac{2}{5}$ must be shown
<b>16</b>	(a) $\begin{pmatrix} 9 \\ 6 \end{pmatrix}$ (b) 10.8 or 10.81 to 10.82 (c) (17, 13)	<b>1</b> <b>2FT</b> <b>1FT</b>	<b>M1</b> for $\sqrt{(their\ 9)^2 + (their\ 6)^2}$ <b>A1</b> for 10.8 or FT correctly evaluated FT <i>their</i> 9 and 6. (8 + <i>their</i> 9, 7 + <i>their</i> 6) correctly evaluated
<b>17</b>	(a) $(a+b)(1+t)$ (b) $(x-6)(x+4)$	<b>2</b> <b>2</b>	<b>B1</b> for $1(a+b) + t(a+b)$ or $a(1+t) + b(1+t)$ <b>SC1</b> for answer of $(x+a)(x+b)$ where $ab = -24$ or $a+b = -2$
<b>18</b>	486 cao	<b>4</b>	<b>M1</b> for $\frac{1}{2} \times 4\pi^2 + \pi^2 = 243\pi$ or better <b>A1</b> for $[r=] 9$ <b>M1</b> for $\frac{1}{2} \times \frac{4}{3} [\pi] (their\ r)^3$

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<b>19</b>	(a) 40  (b) 3.5	<b>2</b>  <b>2FT</b>	<b>M1</b> for $\frac{144 \times 1000}{60 \times 60}$ oe  <b>FT</b> 140 ÷ <i>their</i> (a) <b>M1</b> for dist ÷ <i>their</i> (a) or dist ÷ 40 or dist × $\frac{60 \times 60}{144 \times 1000}$ or <b>B1</b> for 140 seen
<b>20</b>	(a) (i) Accurate bisector of angle <i>B</i> with correct arcs  (ii) Accurate perpendicular bisector of <i>BC</i> with correct arcs  (b) correct region shaded	<b>2</b>  <b>2</b>  <b>1</b>	<b>B1</b> for correct line or correct arcs  <b>B1</b> for correct line or correct arcs
<b>21</b>	(a) 73.7 or 73.73 to 73.74  (b) 120	<b>3</b>  <b>2</b>	<b>M1</b> for $\frac{20}{3+2} \times 2$ or <b>B1</b> for <i>BX</i> = 8  <b>M1</b> for $\tan [ ] = \frac{6}{\textit{their} 8}$ or better  <b>M1</b> for $\frac{1}{2} \times 20 \times 12$ oe
<b>22</b>	(a) (i) $\frac{5}{50}$ oe  (ii) $\frac{11}{50}$ oe  (b) $\frac{11}{16}$ oe  (c) $\frac{380}{2450}$ oe  (d) 	<b>1</b>  <b>1</b>  <b>1</b>  <b>2</b>  <b>1</b>	<b>M1</b> for $\frac{20}{50} \times \frac{19}{49}$