

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
International General Certificate of Secondary Education

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

|                         |   |
|-------------------------|---|
| <b>0580 MATHEMATICS</b> |   |
| <b>0580/21</b>          | 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.

|               |                                      |                 |              |
|---------------|--------------------------------------|-----------------|--------------|
| <b>Page 2</b> | <b>Mark Scheme</b>                   | <b>Syllabus</b> | <b>Paper</b> |
|               | <b>IGCSE – October/November 2013</b> | <b>0580</b>     | <b>21</b>    |

### Abbreviations

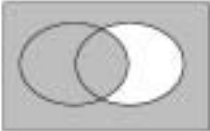
|     |                            |
|-----|----------------------------|
| cao | correct answer only        |
| cso | correct solution only      |
| dep | dependent                  |
| ft  | follow through after error |
| isw | ignore subsequent working  |
| oe  | or equivalent              |
| SC  | 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<br>or <b>B1</b> for $24 - 2x = 3x$ oe<br>or $5 = 5x - 19$ oe  |
| 6   | (a) $\frac{2}{6}$ oe<br><br>(b) 200                                    | 1<br><br><b>1FT</b> | <br><br>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<br>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<br>or <b>M1</b> for $\frac{x \times 3 \times 5}{100} = 20.1$<br>or $3\% = 4.02$ oe<br><br>If 0 scored <b>SC1</b> for answer of figs 134 |
| 9   | (a) $\frac{n}{n+2}$ oe final answer<br><br>(b) $n^2-1$ oe final answer | 1<br><br>2          | <br><br><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<br><b>M1</b> for correct re-arrangement<br><b>M1</b> for correct square root   |

| Page 3 | Mark Scheme                   | Syllabus | Paper |
|--------|-------------------------------|----------|-------|
|        | IGCSE – October/November 2013 | 0580     | 21    |

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

| Page 4 | Mark Scheme                   | Syllabus | Paper |
|--------|-------------------------------|----------|-------|
|        | IGCSE – October/November 2013 | 0580     | 21    |

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