



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**MATHEMATICS**

**0580/11**

Paper 1 (Core)

**October/November 2016**

MARK SCHEME

Maximum Mark: 56

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**Published**

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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            |

| Question | Answer                                                       | Mark | Part marks                                                                                                                                                                                                                                                                                 |
|----------|--------------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | Thirty million[s]                                            | 1    |                                                                                                                                                                                                                                                                                            |
| 2        | −7                                                           | 1    |                                                                                                                                                                                                                                                                                            |
| 3        | $\frac{1}{8}$ cao                                            | 1    |                                                                                                                                                                                                                                                                                            |
| 4 (a)    | [0].0402                                                     | 1    |                                                                                                                                                                                                                                                                                            |
| (b)      | [0].040                                                      | 1    |                                                                                                                                                                                                                                                                                            |
| 5        | Fully correct triangle with correct arcs                     | 2    | <b>B1</b> for correct triangle without arcs or for correct position of arcs<br>If zero scored,<br><b>SC1</b> for fully correct reversed triangle with arcs ie $AB = 6$ cm and $AC = 7$ cm<br><b>or</b> for triangle with only one of $AB$ <b>or</b> $AC$ correct length with suitable arcs |
| 6        | $\sqrt{0.33}$ , 58%, $\frac{18}{31}$ , $\frac{7}{12}$ , 0.59 | 2    | <b>B1</b> for 4 in correct order<br><br>or <b>M1</b> for 3 of the following or better<br>0.583..., 0.574..., 0.58, 0.5806..<br>or 58.5%, 57.4%, 58.06%, 59%                                                                                                                                |
| 7        | $\begin{pmatrix} 12 \\ -16 \end{pmatrix}$                    | 2    | <b>B1</b> for one correct component<br>or for $\begin{pmatrix} 10 \\ -12 \end{pmatrix}$ seen                                                                                                                                                                                               |

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|        |                                                                       |                        |                                                                                                                                              |
|--------|-----------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 8      | $\frac{8}{12}$ and $\frac{3}{12}$ oe                                  | M1                     | Correct fractions with common denominator                                                                                                    |
|        | $\frac{5}{12}$ cao                                                    | A1                     |                                                                                                                                              |
| 9      | 50.3 or 50.26 to 50.272                                               | 2                      | M1 for $2 \times \pi \times 8$ oe                                                                                                            |
| 10     | 216                                                                   | 2                      | M1 for $48 \div 2 [ \times 9 ]$                                                                                                              |
| 11 (a) | E                                                                     | 1                      |                                                                                                                                              |
| (b)    | 0 or zero                                                             | 1                      |                                                                                                                                              |
| 12 (a) | Positive                                                              | 1                      |                                                                                                                                              |
| (b)    | Zero oe                                                               | 1                      |                                                                                                                                              |
| 13 (a) | 8                                                                     | 1                      | M1 for ordered list of at least the first 6 or last 6 values provided any following work is an attempt at the median                         |
| (b)    | 6                                                                     | 2                      |                                                                                                                                              |
| 14 (a) | 72                                                                    | 1                      |                                                                                                                                              |
| (b)    | 6                                                                     | 1                      |                                                                                                                                              |
| (c)    | 17                                                                    | 1                      |                                                                                                                                              |
| 15     | Correctly eliminating one variable<br><br>[x =] -1 and<br><br>[y =] 5 | M1<br><br>A1<br><br>A1 | If zero scored,<br>SC1 for 2 values that satisfy one of the original equations<br>or<br>SC1 if no working shown, but 2 correct answers given |

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|    |         |                                                                                                                |   |                                                                                                                                                 |
|----|---------|----------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 16 | (a)     | Accurate arc, centre $B$ , radius 5cm meeting both $BA$ and $BC$                                               | 1 | <b>B1</b> for accurate line from $B$ to at least $AC$<br>or <b>M1</b> for correct arcs                                                          |
|    | (b)     | Accurate bisector through angle $B$ with 2 pairs of correct arcs and reaching to at least $AC$                 | 2 |                                                                                                                                                 |
|    | (c)     | Correct region identified<br> | 1 |                                                                                                                                                 |
| 17 |         | 24.9 or 24.925 or 24.9[24...]                                                                                  | 3 | <b>M2</b> for $[x =] \frac{15}{\sin 37}$ or $[x =] \frac{15}{\cos 53}$<br>or <b>M1</b> for $\sin [37 =] \frac{15}{x}$<br>or $x \sin 37 = 15$ oe |
| 18 | (a)     | $6n + 1$ oe final answer                                                                                       | 2 | <b>B1</b> for $6n + c$ or for $kn + 1, (k \neq 0)$                                                                                              |
|    | (b)     | $(n + 2)^2$ final answer                                                                                       | 2 | <b>M1</b> for any quadratic expression or reaching second difference of 2                                                                       |
| 19 | (a)     | 54                                                                                                             | 1 | Independent mark                                                                                                                                |
|    | (b)     | 61                                                                                                             | 1 |                                                                                                                                                 |
|    |         | Angle[s] [in a] triangle [add to] 180                                                                          | 1 |                                                                                                                                                 |
|    | (c) (i) | 48                                                                                                             | 1 |                                                                                                                                                 |
|    | (ii)    | 42                                                                                                             | 1 |                                                                                                                                                 |
|    |         |                                                                                                                |   | <b>FT 90</b> – <i>their (c)(i)</i> if <i>their (c)(i)</i> is acute                                                                              |

|               |                                                |                 |              |
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|           |            |                                                                                                |            |                                                                                                                                                                                                       |
|-----------|------------|------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>20</b> | <b>(a)</b> | (1, 4)                                                                                         | <b>1</b>   | <b>Strict FT of <i>their</i> (b)</b>                                                                                                                                                                  |
|           | <b>(b)</b> | Point plotted at ( 5, -2)                                                                      | <b>1</b>   |                                                                                                                                                                                                       |
|           | <b>(c)</b> | Isosceles                                                                                      | <b>1FT</b> |                                                                                                                                                                                                       |
|           | <b>(d)</b> | $\begin{pmatrix} -4 \\ -6 \end{pmatrix}$                                                       | <b>1</b>   |                                                                                                                                                                                                       |
|           | <b>(e)</b> | (-5, 3)                                                                                        | <b>1</b>   |                                                                                                                                                                                                       |
| <b>21</b> | <b>(a)</b> | 2                                                                                              | <b>2</b>   | <b>M1</b> for one correct step<br>e.g. $4x = 11 - 3$ or $x + \frac{3}{4} = \frac{11}{4}$<br>or better                                                                                                 |
|           | <b>(b)</b> | $[x = ] \sqrt{\frac{y+2}{4}}$ or $\sqrt{(y+2)/4}$<br>or $\frac{\sqrt{y+2}}{2}$ oe final answer | <b>3</b>   | <b>M1</b> for one correct step<br>e.g. $y + 2 = 4x^2$ or $\frac{y}{4} = x^2 - \frac{2}{4}$<br><b>M1</b> for a further correct step<br>e.g. $\frac{y+2}{4} = x^2$ or $\frac{y}{4} + \frac{2}{4} = x^2$ |