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 May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.
### Mark Scheme

<table>
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<tr>
<th>Question</th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
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<tbody>
<tr>
<td>1</td>
<td>357 200</td>
<td>34</td>
<td>335 or 334.7 to 334.8</td>
</tr>
</tbody>
</table>

#### (a)
- **3 M1** for $230,000 \times 1.045^{10}$ oe
- **A1** for 357,000, 357,180, 357,182 to 357,183

#### (b)
- **3 M2** for $\log_{1.045}(1,000,000/230,000)$ oe or suitable sketch indicating solution or trial and improvement giving values either side of 1,000,000.
- **M1** for $230,000 \times 1.045^n$ = 1,000,000 oe or for suitable sketch but not indicating solution or for trial and improvement by using powers of 1.045 with at least 3 trials greater than 10.
- **SC2** for 33

#### (c)
- **3 M2** for $\frac{1,000,000 - 230,000}{230,000} \times 100$ or $\frac{1,000,000}{230,000} \times 100 - 100$
- **M1** for $\frac{1,000,000 - 230,000}{230,000}$ or $\frac{1,000,000}{230,000} \times 100$
- (3.34782…) or (434.782…)

### Question 2

<table>
<thead>
<tr>
<th>(a)</th>
<th>(i)</th>
<th>(ii)</th>
<th>(iii)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>[0] 9 10 oe cao</td>
<td>64 cao</td>
<td>12.16</td>
</tr>
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</table>

#### (a)
- **3 M1** for $\frac{30}{40}$ and $\frac{50}{100}$ oe and **M1** for 07 55 + *their* two times

#### (b)
- **2 M1** for $\frac{50 + 30}{two \ times \ added}$

#### (c)
- **2 M1** for $\frac{80}{100} \times 9.5 \times 1.6$ oe
- **2 M1** for $2 \times 8.80 + 3 \times 5.5 + 5 \times 6.25$

#### Question 2 (c)
- **2 FT** **M1** for $2 \times *their* (a)(iii) + *their* (b) + 24.23 \div 5$
- **SC1 FT** for 20.34 to 20.35

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### Question 3

**Part (a)**

\[ 2 < x \leqslant 7 \]

**Part (b)**

\[ -2 < x < 0, \quad 1 < x < 4 \]

**Part (c)**

\[ \frac{\pm \sqrt{4^2 - 4(1)(2)}}{2(1)} \]

or \[ x + 2 = \pm \sqrt{2} \]

\[-3.41, -0.59\]

- **M1**

- **B1 B1**

  SC2 for inequalities with \( \leqslant \) for \(<\).
  SC1 for either inequality, condoning \( \leqslant \) for \(<\) or for the 4 values seen

- **B0, SC1** for \(-3.4\) and \(-0.6\) or \(-3.414\ldots\)

  and \(-0.586\) or \(-0.5858\) to \(-0.5857\)

### Question 4

**Part (a) (i)**

\[-p + q\]

**Part (a) (ii)**

\[ q + 2p\]

**Part (b) (i)**

\[(9, 5)\]

**Part (b) (ii)**

\[-3y = -6 \text{ or } -x + 3y = 6\]

- **M1**

  \(\text{for gradient } \frac{\text{rise}}{\text{run}} \left( \frac{2}{6} \right)\)

  and **M1** for substituting a pair of given co-ordinates into a linear equation.

  **A1** for correct equation in another form seen.

### Question 5

**Part (a)**

\[58.5, 44, 72\]

**Part (b)**

\[58.1, 60.3\]

**Part (c)**

\[-0.0214g + 61.5\]

\[-0.02137\ldots, 61.54\ldots\]

**Part (d) (i)**

\[60 \text{ or } 60.3 \text{ to } 60.4\]

**Part (d) (ii)**

No correlation oe

- **1FT**

  **FT** their (c)

- **B1 B1**

  SC1 for 0.022 or 0.02217\ldots, 0.0217\ldots, 0.02137\ldots.

  \[g \text{ or } -0.0214g + k (-0.02137\ldots) \neq 0\]

  or \[kg + 61.5 (61.54\ldots) \neq 0\]
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<td></td>
<td>0607</td>
<td>43</td>
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</tbody>
</table>

6  (a)  

- **2** B1 for reasonable shape  
- **2** B1 for minimum at (0, 0)

(b)  

- **2** SC1 for (0, 0) and (5, 0)

(c)  

- **1**

(d)  

- **2** B1 for either limit. Condone strict inequalities

(e)  

- Any negative integer or integer $> 256$

7  (a)  

- **3** M2 for $(6 \times 180 - 5 \times 129) \div 3$ or M1 for sum of interior angles $= 6 \times 180$ or $135 \times 8$ or 1080.

(b)  

- **3** B2 for $2x = 36$  
- **M1** for $6x + 2 = 2(2x + 19)$

(c)  

- **3** M2 for $5.1 \times \left(\frac{5}{3}\right)^2$ or M1 for use of $\left(\frac{5}{3}\right)^2$ or $\left(\frac{3}{5}\right)^2$

8  (a)  

(i)  

- **3** M2 for $\frac{40}{360} \times \pi \times 9^2 \times 5$  
- **M1** for $\frac{40}{360} \times \pi \times 9^2$

- 9$\pi$ or 28.27 to 28.28 or 28.3

(ii)  

- **5** M1 for $\frac{40}{360} \times \pi \times 9^2$ or *their* area in part (i)  
- and **M1** for $5 \times 9$

- and **M2** for $\frac{40}{360} \times \pi \times 18 \times 5$

- or **M1** for $\frac{40}{360} \times \pi \times 18 \times (2\pi)$

(b)  

- **2** B1 for 1440  
- or **B1FT** for *their* total $\div 1000$

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</table>
| 9 (a) | ![Graph](image1) | 2 | B1 graph of $y = x^3$ correct shape oe  
B1 graph of $y = 3^{-x}$ correct shape oe |
| | 0.758 or 0.7576 to 0.7577 | 1 | |
| (b) | ![Graph](image2) | 2 | B1 graph of $y = x^3 - 2x - 3$ correct shape oe  
B1 graph of $y = \log(x + 2)$ correct shape oe |
| | $-1$ 3.17 or 3.171… | 1 | (penalty – 1 if y-coords in answer) |
| 10 (a) | 63.064… | 3 | M2 for $\cos = \frac{18^2 + 26^2 - 24^2}{2 \times 18 \times 26} = \frac{424}{936} = \frac{53}{117}$  
or M1 for $24^2 = 18^2 + 26^2 - 2 \times 18 \times 26 \cos C$ |
| | 24.1 or 24.07… | 3 | M2 for $\frac{18 \sin 78}{\sin 47}$  
or M1 for $\frac{\sin 78}{LV} = \frac{\sin 47}{18}$ oe |
| (b) | ![Graph](image3) | 1 | |
| (c) (i) | 16.0 or 16.1 or 16.04 to 16.05… | 2 | M1 for $18 \sin(63.06)$ |
| (ii) | 208 or 209 or 208.0 to 209.3 | 2 | M1 for $\frac{1}{2} \times 26$ their (c)(i)  
or $\frac{1}{2} \times 18 \times 26 \sin(63.06)$ oe |
| (d) (i) | 147 or 147.06 to 147.1 | 1 | FT 180 + their part (d)(i) only if answer in range 270 to 360 |
| (ii) | 327 or 327.06 to 327.1 | | |
| 11 (a) | $\frac{7x - 5}{(2x - 1)(x - 2)}$ oe final answer | 3 | B1 for correct denominator  
B1 for numerator = $x - 2 + 3(2x - 1)$ or better |
| (b) | $\frac{x + 1}{x + 3}$ final answer | 5 | B2 for $[x](x - 1)(x + 1)$ or B1 for $[x](x^2 - 1)$  
B2 for $[x](x + 3)(x - 1)$ or SC1 for $[x](x + a)(x + b)$ where $ab = -3$ or $a + b = 2$ |
### 12 (a)
34.4 or 34.41 to 34.42

(b) Correct histogram

<table>
<thead>
<tr>
<th>Mark</th>
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</tr>
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<tbody>
<tr>
<td>2</td>
<td>M1 for at least 2 correct mid-values soi.</td>
</tr>
<tr>
<td>3</td>
<td>B1 for correct column widths and B2 for heights of 0.2, 3.6, 1.4 and 0.3 or B1 for 2 correct heights</td>
</tr>
</tbody>
</table>

### 13 (a) (i) \( \frac{5}{6} \) oe

(ii) \( \frac{2}{6} \) oe

(b) (i) \( \frac{12}{36} \) oe

(ii) \( \frac{30}{36} \) oe

(iii) \( \frac{11}{36} \) oe

<table>
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<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M1 for ( \frac{4}{6} \times \frac{3}{6} ) oe</td>
</tr>
<tr>
<td>3</td>
<td>M2 for ( 1 - \frac{2}{6} \times \frac{3}{6} ) or ( \frac{4}{6} \times \frac{3}{6} + \frac{2}{6} \times \frac{3}{6} + \frac{4}{6} \times \frac{3}{6} ) oe</td>
</tr>
<tr>
<td></td>
<td>or M1 for ( \frac{2}{6} \times \frac{3}{6} ) with no other products</td>
</tr>
<tr>
<td></td>
<td>or ( \frac{4}{6} \times \frac{3}{6} + \frac{2}{6} \times \frac{3}{6} + \frac{4}{6} \times \frac{3}{6} ) with two products correct</td>
</tr>
<tr>
<td>2</td>
<td>M1 for ( 1 - \frac{5}{6} \times \frac{5}{6} ) or ( \frac{1}{6} \times \frac{1}{6} + \frac{5}{6} \times \frac{5}{6} ) oe</td>
</tr>
<tr>
<td></td>
<td>or ( \frac{1}{6} + \frac{1}{6} - \frac{1}{6} \times \frac{1}{6} )</td>
</tr>
</tbody>
</table>

### 14 (a) 23.2 or 23.19 to 23.20

(b) 14.2 or 14.21… or \( \sqrt{202} \)

(c) 12.2 or 12.18 to 12.20

<table>
<thead>
<tr>
<th>Mark</th>
<th>Description</th>
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<tbody>
<tr>
<td>2</td>
<td>M1 for tan = ( \frac{3}{7} ) oe</td>
</tr>
<tr>
<td>3</td>
<td>M2 for ( \sqrt{12^2 + 7^2 + 3^2} ) oe</td>
</tr>
<tr>
<td></td>
<td>or M1 for a correct Pythagoras statement for one face</td>
</tr>
<tr>
<td>2FT</td>
<td>FT their (b) M1 for sin = ( \frac{3}{\text{their(b)}} ) oe</td>
</tr>
</tbody>
</table>