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NOTES ON MARKING PRINCIPLES

1  Types of mark
   M marks: method marks
   A marks: accuracy marks
   B marks: unconditional accuracy marks (independent of M marks)

2  Abbreviations
   cao – correct answer only
   isw – ignore subsequent working
   oe – or equivalent (and appropriate)
   ft – follow through
   SC: special case
   dep – dependent
   indep - independent

3  No working
   If no working is shown then correct answers normally score full marks
   If no working is shown then incorrect (even though nearly correct) answers score no marks.

4  With working
   If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
   If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
   If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
   If there is no answer on the answer line then check the working for an obvious answer.
   Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
   If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

5  Follow through marks
   Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

6 Ignoring subsequent work
It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

7 Probability
Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

8 Linear equations
Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

9 Parts of questions
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

10 Money notation
Accepted with and without the “p” at the end.

11 Range of answers
Unless otherwise stated, when any answer is given as a range (e.g 3.5 - 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1).
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<thead>
<tr>
<th>Question</th>
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</thead>
</table>
| 1        | (a) $1 - (0.2 + 0.1 + 0.5)$  
$= 1 - 0.8$  
(b) $800 \times 0.2$ | 0.2  
160 | 2 | M1 for $1 - (0.2 + 0.1 + 0.5)$ oe  
A1 for 0.2 oe  
M1 for $800 \times 0.2$ oe  
A1 cao |
| 2        | Correct enlargement s.f. $\frac{1}{2}$, centre P | | 3 | B3 for correct enlargement s.f. $\frac{1}{2}$ centre P  
(B2 for correct enlargement s.f. $\frac{1}{2}$, incorrect centre or correct enlargement P, s.f $\neq \frac{1}{2}$, 1, centre P)  
(B1 for correct enlargement s.f $\neq \frac{1}{2}$, 1, incorrect centre or for 2 sides correctly enlarged, s.f. $\frac{1}{2}$) |
| 3        | (a) $3 \times 3 \times 5$ | 2 | M1 for $9 \times 5$ or $3 \times 15$ or $3, 3, 5$ seen or a fully correct factor tree or $3 \times 3 \times 5 \times 1$  
A1 for $3 \times 3 \times 5$ or $3^2 \times 5$  
M1 for $30 = 3 \times 2 \times 5$ or a fully correct factor tree  
A1 cao  
Or  
M1 for at least 4 correct factors of 30 and at least 4 correct factors of 45 with in each case at most 1 incorrect factors  
A1 cao  
SC B1 for 3 or 5 |
<p>|          | (b) $15$ | 2 | | |</p>
<table>
<thead>
<tr>
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</table>
| 4        | $\begin{pmatrix} x & -2 & -1 & 0 & 1 & 2 & 3 \\ y & -10 & -6 & -2 & 2 & 6 & 10 \end{pmatrix}$ | correct line | 3 | (Table of values)  
M1 for at least 2 correct attempts to find points by substituting values of $x$.  
M1 ft for plotting at least 2 of their points (any points plotted from their table must be correct)  
A1 for correct line between -2 and 3  
(No table of values)  
M2 for at least 2 correct points (and no incorrect points) plotted OR  
line segment of $4x-2$ drawn (ignore any additional incorrect segments)  
(M1 for at least 3 correct points with no more than 2 incorrect points)  
A1 for correct line between -2 and 3  
(Use of $y=mx+c$)  
M2 for line segment of $4x-2$ drawn (ignore any additional incorrect segments)  
(M1 for line drawn with gradient of 4 OR line drawn with a $y$ intercept of -2 and a positive gradient)  
A1 for correct line between -2 and 3 |
| 5        | $\pi(6)^2 - \pi(5)^2$  
$= 113.0973\ldots - 78.5398\ldots$  
$=34.55751919$ | 34.6 | 3 | M1 for $\pi(6)^2$ oe or $\pi(5)^2$ oe or 113… or 78.5…  
M1 for $\pi(6)^2 - \pi(5)^2$ oe  
A1 for 34.5 - 34.6 |
<table>
<thead>
<tr>
<th>Question</th>
<th>Working</th>
<th>Answer</th>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
</table>
| 6 (a)    | 1 6 8  
2 1 5 7 8 8  
3 0 6 6 6 8  
4 1 5 8 8  
Key: 1 | 6 = 16  
33 | 3 | B2 for a fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most two errors or omissions)  
B1 for a correct key (Accept stem written as 10, 20 etc but key only acceptable if consistent with this) |
| 6 (b)    | Middle numbers = 30 and 36  
(b) | 33 | 2 | B2 for 33 or ft from ordered stem and leaf diagram (B1 for ‘30,36’ written or both ringed in the ordered stem and leaf diagram or in a fully ordered list ft or indicated in an unambiguous way) |
| 7        | \( \frac{3}{4} \times 120 = 90  
120 - 90 = 30 \) left  
30 ÷ 3 | 10 | 3 | M1 for \( \frac{3}{4} \times 120 \) oe or 90  
or \( \frac{1}{4} \times 120 \) oe or 30  
M1(dep) for ‘30’ – (2 ÷ ‘30’ ÷ 3) oe  
or \( \frac{1}{\text{left}} \times ‘30’ \) oe  
A1 cao |
<p>| 8        | draw rotation | 2 | B2 for correct rotation, correct centre (B1 for correct orientation or 90° anticlockwise about O) |</p>
<table>
<thead>
<tr>
<th>Question</th>
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<th>Answer</th>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>( \frac{1}{2} (8 \times 15) \times 2 + (17 \times 10) + (15 \times 10) + (8 \times 10) = 60 + 60 + 170 + 150 + 80 ) cm(^2)</td>
<td>520</td>
<td>4</td>
<td>M1 a correct expression for area of one face M1 for five area expressions added (at least three correct) A1 cao NB: if volume calculated then no marks B1 (indep) for cm(^2)</td>
</tr>
<tr>
<td>10</td>
<td>(a)</td>
<td>( 7e + 2f )</td>
<td>2</td>
<td>B2 cao (B1 for 7e or + 2f seen)</td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>( 8x - 4 = 3x - 19 ) ( 8x - 3x = -19 + 4 ) ( 5x = -15 )</td>
<td>(-3)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(c)</td>
<td>( y + 4 = 150 ) ( y = 150 - 4 )</td>
<td>146</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>(a)</td>
<td>0</td>
<td>1</td>
<td>B1 cao</td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>( (0 + 6 + 14 + 24 + 8) \div 32 = 52 \div 32 = 1.625 )</td>
<td>1.625</td>
<td>3</td>
</tr>
</tbody>
</table>
### Question 12

<table>
<thead>
<tr>
<th>Question</th>
<th>Working</th>
<th>Answer</th>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(x \times 5x)</td>
<td>3.7</td>
<td>4</td>
<td>B2 for a trial between 3 and 4 exclusive (B1 for a trial between 3 and 4 inclusive) B1 for a different trial of (3.65 \leq x &lt; 3.7) B1 (dep on at least one previous B1) for 3.7</td>
</tr>
<tr>
<td>3</td>
<td>42</td>
<td></td>
<td></td>
<td>NB Trials should be evaluated to at least 2 s.f truncated or rounded for values of (x) correct to 1 dp. Trials should be evaluated to at least 1 dp for values of (x) correct to 2 dp truncated or rounded. No working scores 0 marks</td>
</tr>
<tr>
<td>3.4</td>
<td>56.304</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>60.375</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6</td>
<td>64.656</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.7</td>
<td>69.153</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.8</td>
<td>73.872</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.9</td>
<td>78.819</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>84</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.65</td>
<td>66.8(77)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.66</td>
<td>67.3(27)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.67</td>
<td>67.7(80)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.68</td>
<td>68.2(36)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.69</td>
<td>68.6(93)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Question 13

<table>
<thead>
<tr>
<th>Question</th>
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<th>Answer</th>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(\sqrt{\frac{920-364.5661765}{0.046}}) (= \sqrt{12074.64834})</td>
<td>109.88(47047)</td>
<td>2</td>
<td>B2 for 109.88(….. (B1 for 12074 seen …. or 555.43 seen …. or 109 to 110)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>110</td>
<td>1</td>
<td>B1 f.t. provided answer to (a) is more than 3 s.f.</td>
</tr>
</tbody>
</table>

\(=\)
<table>
<thead>
<tr>
<th>Question</th>
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<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>(a)(i)</td>
<td>4(3n + 1)</td>
<td>1</td>
<td>B1 cao</td>
</tr>
<tr>
<td></td>
<td>(ii)</td>
<td>3(n + 4)</td>
<td>1</td>
<td>B1 cao</td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>2n + 1</td>
<td>1</td>
<td>B1 cao</td>
</tr>
<tr>
<td>15</td>
<td>(a)</td>
<td><img src="image" alt="Diagram" /></td>
<td>2</td>
<td>B2 for an open circle at –3 with either an arrow to the right or a line segment from –3 to at least 5, ±2 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(B1 for an open circle at –3 with either an arrow to the left or an incorrect line segment OR a closed circle or no circle at –3 with either an arrow to the right or a line segment from –3 to at least 5 ±2 mm)</td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>7y ≤ 8 – 36</td>
<td>2</td>
<td>M1 for a correct process to isolate 7y in an inequality or y = −4 or y &lt; −4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7y ≤ −28</td>
<td></td>
<td>A1 cao</td>
</tr>
<tr>
<td>Question</td>
<td>Working</td>
<td>Answer</td>
<td>Mark</td>
<td>Notes</td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
<td>--------</td>
<td>------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| 16       | (100% − 10%) × Normal Price = £4.86
Normal Price = £4.86 ÷ 0.9 | £5.40 | 3 | M1 for ‘4.86 is 90%’
or (100% − 10%) × Normal Price = 4.86 or 4.86 ÷ 90
M1 for 4.86 ÷ 0.9 or 4.86 × 10 ÷ 9 oe
A1 £5.40 (accept 5.4)
OR
M1 10% = £0.54 or £4.86 ÷ 9
M1 (dep) £4.86 + ‘£0.54’
A1 £5.40 (accept 5.4) |
| 17       | (a) $BC ÷ 12 = 10 ÷ 6$
$BC = 10 × 12 ÷ 6$ | 20 | 2 | M1 for 12 ÷ 6 or 6 ÷ 12 or 10 ÷ 6 or 6 ÷ 10 oe
or a decimal equivalent including 1.6, 1.66..., 1.67 or 1.7
A1 19.9 – 20.4 |
|          | (b) $PR ÷ 18 = 6 ÷ 10$
$PR = 6 × 18 ÷ 10$ | 10.8 | 2 | M1 for 6 × 18 ÷ 10 oe or
18 ÷ (1.6, 1.66..., 1.67, 1.7) oe or a complete method ft ‘20’ eg 12 ÷ ‘20’ × 18
A1 for 10.8 |
<table>
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<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>$12x^2 - 3x + 20x - 5$ OR $12x^2 + 17x - 5$</td>
<td>$c^8k^{20}$</td>
<td>1</td>
<td>B1</td>
</tr>
</tbody>
</table>
| OR       | $\begin{array}{c|cc|c|c}
| \times & 3x & (+) 5 \\
| 4x & 12x^2 & (+)20x \\
| -1 & -3x & -5 \\
\end{array}$ | | 2 | B2 for fully correct (B1 for 3 out of 4 terms correct in working including signs OR 4 terms correct, ignore signs. In a grid the 20x need not be signed) |
<p>| (c)      | $(x - 5)(x + 2) = 0$ | 5 and $-2$ | 3 | M1 for $(x \pm 5)(x \pm 2)$ A1 for $(x - 5)(x + 2) = 0$ B1 ft (dep on M1) for $x = 5$ and $-2$ or M1 for correct substitution in formula allow sign errors in $b$ and $c$ M1 for reduction to $\frac{3 \pm \sqrt{49}}{2}$ A1 for 5 and $-2$ or M1 for $(x - \frac{3}{2})^2 - \left(\frac{3}{2}\right)^2 - 10 = 0$ M1 for $\frac{3}{2} \pm \sqrt{\frac{49}{4}}$ A1 for 5 and $-2$ or T&amp;I B3 both roots (B1 one root) |</p>
<table>
<thead>
<tr>
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<th>Answer</th>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>(6.21795 \times 10^{10}) \div 510,072,000 = 121.9(03378…)</td>
<td>1.22 \times 10^2</td>
<td>3</td>
<td>M1 for SA Jupiter ÷ SA Earth eg (6.21795 \times 10^{10}) ÷ 510,072,000 oe, eg 62000 ÷ 51 or digits 121 … or digits 122 A1 for 121 – 122 A1 for 1.21 \times 10^2 – 1.22 \times 10^2</td>
</tr>
<tr>
<td>20</td>
<td>(c^2 (b + d)) [\pi a^2 b] [\frac{2a^3 d}{c}]</td>
<td>3</td>
<td>B3 for all 3 correct, no extras (B2 for 2 or 3 correct and 1 incorrect) (B1 for 1 correct and at most 2 incorrect)</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>(i)</td>
<td>54</td>
<td>1</td>
<td>B1 cao</td>
</tr>
<tr>
<td></td>
<td>(ii)</td>
<td>reason</td>
<td>1</td>
<td>B1 for angles in the same segment (are equal), or angles subtended at the circumference by the same chord (are equal) or angles subtended at the circumference by the same arc (are equal)</td>
</tr>
<tr>
<td>22</td>
<td>700 ÷ (750 + 700 + 900) \times 50 = 700 ÷ 2350 \times 50 = 14.8936…</td>
<td>15</td>
<td>2</td>
<td>M1 for 700 ÷ (750 + 700 + 900) \times 50 or 14.8…or 14.9 seen A1 cao</td>
</tr>
</tbody>
</table>
### Question 23

#### (a)

\[
x(2x + 6) - 3x = 100 \\
x^2 + 6x - 3x = 100 \\
x^2 + 3x - 100 = 0
\]

**Answer:**

Proof

**Mark:**

3

- **Notes:**
  - M1 for a correct algebraic expression for the area of at least one rectangle
  - eg \( x(2x + 6) \) or \( 2x^2 + 6x \) or \( 3x \) oe
  - M1 for a correct algebraic expression for the area of the unshaded region
  - eg \( x(2x + 6) - 3x \) (= 100)
  - or for eg \( x(2x+6)=100+3x \)

#### (b)

- \( a = 2 \)
- \( b = 3 \)
- \( c = -100 \)

\[
x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}
\]

\[
x = \frac{-3 \pm \sqrt{809}}{4}
\]

\[
x = 6.36073... \text{ or } -7.86073...
\]

**OR**

\[
x^2 + \frac{3}{2}x - 50 = 0
\]

\[
(x + \frac{3}{4})^2 - (\frac{3}{4})^2 - 50 = 0
\]

\[
x + \frac{3}{4} = \pm \sqrt{\frac{3}{4}}^2 + 50
\]

\[
x = 6.36073... \text{ or } -7.86073...
\]

**Answer:**

6.36

**Mark:**

4

- **Notes:**
  - M1 for correct substitution in formula allow sign errors in \( b \) and \( c \)
  - M1 for reduction to \( \frac{-3 \pm \sqrt{809}}{4} \) or \( \frac{-3 \pm \sqrt{809}}{4} \)
  - A1 for 6.36 to 6.365 or -7.86 to -7.865
  - A1 for 6.36 to 6.365
  - OR
  - M1 for \( (x + \frac{3}{4})^2 \)
  - M1 for \( -\frac{3}{4} \pm \sqrt{\frac{9 + 800}{16}} \) or \( -\frac{3}{4} \pm \sqrt{\frac{9 + 800}{16}} \)
  - A1 for 6.36 to 6.365 or -7.86 to -7.865
  - A1 for 6.36 to 6.365
  - SC: T&I scores 1 mark for 1 correct root or 4 marks for correct length
<table>
<thead>
<tr>
<th>24</th>
<th>( \left( \frac{5}{10} \times \frac{4}{9} \right) + \left( \frac{3}{10} \times \frac{2}{9} \right) + \left( \frac{2}{10} \times \frac{1}{9} \right) )</th>
<th>28 [ \frac{2}{9} + \frac{2}{9} + \frac{1}{9} ]</th>
<th>4</th>
<th>( \frac{4}{9} ) or ( \frac{2}{9} ) or ( \frac{1}{9} ) seen as 2(^{nd}) probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( = \frac{20 + 6 + 2}{90} )</td>
<td>( \frac{90}{90} )</td>
<td></td>
<td><strong>B1</strong> for ( \frac{4}{9} ) or ( \frac{2}{9} ) or ( \frac{1}{9} ) seen as 2(^{nd}) probability</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>M1</strong> for ( \frac{5}{10} \times \frac{4}{9} ) or ( \frac{3}{10} \times \frac{2}{9} ) or ( \frac{2}{10} \times \frac{1}{9} )</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>M1</strong> for ( \frac{5}{10} \times \frac{4}{9} ) + ( \frac{3}{10} \times \frac{2}{9} ) + ( \frac{2}{10} \times \frac{1}{9} )</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>A1</strong> for ( \frac{28}{90} ) oe</td>
</tr>
<tr>
<td></td>
<td><strong>SC</strong> Sample Space . <strong>B4</strong> for ( \frac{28}{90} )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Otherwise <strong>B0</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alternative scheme for replacement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>B0</strong> for 2(^{nd}) probability with denominator 10</td>
</tr>
<tr>
<td></td>
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<td><strong>M1</strong> for ( \frac{5}{10} \times \frac{5}{10} ) or ( \frac{3}{10} \times \frac{3}{10} ) or ( \frac{2}{10} \times \frac{2}{10} )</td>
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<td><strong>M1</strong> for ( \frac{5}{10} \times \frac{5}{10} ) + ( \frac{3}{10} \times \frac{3}{10} ) + ( \frac{2}{10} \times \frac{2}{10} )</td>
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<td><strong>A0</strong></td>
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<td><strong>S.C.</strong> If M0 scored, award <strong>B2</strong> for ( \frac{38}{100} ) oe</td>
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<tr>
<td>Question</td>
<td>Working</td>
<td>Answer</td>
<td>Mark</td>
<td>Notes</td>
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| 25 (a)  | \(BC = \sqrt{8^2 - 3^2} = \sqrt{55} = 7.416198\ldots\)  
\(CD = 7.416\ldots \div \sin 50^\circ = 9.6811\ldots\) | 9.68 | 4 | M1 for \(8^2 - 3^2\) oe  
M1(dep) for \(\sqrt{8^2 - 3^2}\) or 7.41\ldots or 7.42 seen  
Or  
M1 for \(A = \cos^{-1} \left( \frac{3}{8} \right) = 67.98^\circ\)  
M1(dep) for \(3 \times \tan'67.98'\) or 7.41\ldots or 7.42 seen  
M1 for \('7.4\ldots' \div \sin 50\)  
A1 for 9.67 - 9.69  
SC B3 for -28.2 to -28.3 using rad or 10.4 - 10.5 using grad |
| (b)      | \(CE^2 = 19^2 + 9.68^2 - 2(19)(9.68) \cos 40\)  
\(= 361 + 93.7024 - 367.84(0.766)\)  
\(= 172.920612\)  
\(CE = 13.1499\ldots\) | 13.1 | 3 | M1 for \((CE^2) =\)  
\(19^2 + (9.68)^2 - 2(19) \times (9.68) \times \cos 40\)  
M1(dep) for correct order of evaluation to reach \(\sqrt{172.920612}\)  
A1 for 13.1 - 13.15  
SC B2 26.4(5805\ldots) or 26.5 used radians or 12.5(3449\ldots) used gradians |
| 26       | LB of 218 = 217.5  
UB of 12.6 = 12.65  
217.5 \div 12.65 = 17.1936\ldots\) | 17.1936\ldots\) | 3 | B1 for 217.5 or 12.65 or 12.649 seen  
M1 for LB of 218 \div UB of 12.6 where 217.5 \leq LB < 218 and 12.6 < UB \leq 12.65  
A1 17.19 - 17.2 |