From the June 2007 session, as part of CIE’s continual commitment to maintaining best practice in assessment, CIE has begun to use different variants of some question papers for our most popular assessments with extremely large and widespread candidature. The question papers are closely related and the relationships between them have been thoroughly established using our assessment expertise. All versions of the paper give assessment of equal standard.

The content assessed by the examination papers and the type of questions are unchanged.

This change means that for this component there are now two variant Question Papers, Mark Schemes and Principal Examiner’s Reports where previously there was only one. For any individual country, it is intended that only one variant is used. This document contains both variants which will give all Centres access to even more past examination material than is usually the case.

The diagram shows the relationship between the Question Papers, Mark Schemes and Principal Examiner’s Reports.

Who can I contact for further information on these changes?
Please direct any questions about this to CIE’s Customer Services team at: international@cie.org.uk
1  Work out the value of $\frac{9 - 3 \times 7}{3 \times 2}$.

Answer ...................................... [1]

2  Write the following in order, with the smallest first.

\[
\frac{3}{5} \quad 0.58 \quad 62\%
\]

Answer .................................. < .......... < ......... [1]

3  Jamal arrived at work at 0920 and left at 1715.

How long, in hours and minutes, did he spend at work?

Answer ...................... h ...................... min [1]

4  A piece of wood is 150 centimetres long.

It has to be cut into equal lengths of $6 \frac{1}{4}$ centimetres.

How many of these lengths can be cut from this piece of wood?

Answer ...................................... [1]
5 Daniel plots a scatter diagram of speed against time taken.

As the time taken increases, speed decreases.

Which one of the following types of correlation will his scatter graph show?

<table>
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<tr>
<th>Positive</th>
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*Answer* .................................. [1]

6 The average temperatures in Moscow for each month are shown in the table below.

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<tr>
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<tr>
<td>Temperature °C</td>
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<td>4.5</td>
<td>12.2</td>
<td>16.3</td>
<td>18.5</td>
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<td>10.9</td>
<td>4.3</td>
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(a) Which month has the lowest average temperature?

*Answer(a) .................................. [1]*

(b) Find the difference between the average temperatures in July and December.

*Answer(b) .................................. °C [1]*

7

The bearing of a lighthouse, L, from a port, P, is 145°.

Find the bearing of P from L.

*Answer* .................................. [2]
8 The points $A$ and $B$ are marked on the diagram.

(a) Write $\overrightarrow{AB}$ as a column vector.

Answer (a) $\overrightarrow{AB} = \begin{pmatrix} \phantom{-}1 \\ \phantom{-}2 \end{pmatrix}$ [1]

(b) $\overrightarrow{BC} = \begin{pmatrix} -3 \\ -2 \end{pmatrix}$.

Write down the co-ordinates of $C$.

Answer (b) (........, ........) [1]

9 Expand the brackets and simplify

$3x^2 - x(x-3y)$.

Answer ......................... [2]
The net of a solid is drawn accurately below.

Write down the special name for

(a) the triangles shown on the net,

(b) the solid.

Answer (a) ......................................................... [1]

Answer (b) ......................................................... [1]
12 Write down the equation of the straight line through \((0, -1)\) which is parallel to \(y = 3x + 5\).

\[
\text{Answer } y = \text{...........................................} \quad [2]
\]

13 (a) \(4^p \times 4^5 = 4^{15}\). Find the value of \(p\).

\[
\text{Answer (a) } p = \text{...........................................} \quad [1]
\]

(b) \(2^7 + 2^q = 2^4\). Find the value of \(q\).

\[
\text{Answer (b) } q = \text{...........................................} \quad [1]
\]

(c) \(5^r = \frac{1}{25}\). Find the value of \(r\).

\[
\text{Answer (c) } r = \text{...........................................} \quad [1]
\]

14 (a) Alex changed $250 into euros (€) when the rate was €1 = $1.19886.

How many euros did he receive?

\[
\text{Answer (a) } € \text{...........................................} \quad [2]
\]

(b) Write 1.19886 correct to 3 significant figures.

\[
\text{Answer (b) } \text{...........................................} \quad [1]
\]
15 The diagram shows a regular hexagon and a square.

\[ x \quad y \]

NOT TO SCALE

Calculate the values of \( x \) and \( y \).

\[ \text{Answer } x = \] \[ y = \] [3]

16 Aminata bought 20 metres of cloth at a cost of $80.

She sold 15 metres of the cloth at $5.40 per metre and 5 metres at $3 per metre.

(a) Calculate the profit she made.

\[ \text{Answer(a) } \$ \] [2]

(b) Calculate this profit as a percentage of the original cost.

\[ \text{Answer(b) } \% \] [1]
17  (a) The surface area of the earth is approximately 510,000,000 square kilometres.

Write this number in standard form.

\[ \text{Answer (a)} \quad \text{km}^2 \quad [2] \]

(b) 29.4% of the surface area of the earth is land.

Calculate the area of land.

\[ \text{Answer (b)} \quad \text{km}^2 \quad [2] \]

18

A hot air balloon, \( M \), is 900 metres vertically above a point \( N \) on the ground.

A boy stands at a point \( O \), 1200 metres horizontally from \( N \).

(a) Calculate the distance, \( OM \), of the boy from the balloon.

\[ \text{Answer (a)} \quad OM = \quad \text{m} \quad [2] \]

(b) Calculate angle \( MON \).

\[ \text{Answer (b)} \quad \text{Angle} \; MON = \quad \text{[2]} \]
19 In triangle $ABC$, $AB = 110$ mm, $AC = 65$ mm and $BC = 88$ mm.

(a) Calculate the perimeter of the triangle $ABC$.

\[ \text{Answer (a)} \] \hspace{1cm} \text{mm [1]} 

(b) Construct the triangle $ABC$, leaving in your construction arcs.

The side $AB$ is drawn for you.

\[ A \quad \text{110 mm} \quad B \] \hspace{1cm} [2]

(c) The side $AB$ is 110 mm, **correct to the nearest millimetre**.

Write down the shortest possible length of $AB$.

\[ \text{Answer (c)} \] \hspace{1cm} \text{mm [1]} \]
15 students estimated the area of the rectangle shown below.

Their estimates, in square centimetres, were

\[45 \quad 44 \quad 50 \quad 50 \quad 48\]
\[24 \quad 50 \quad 46 \quad 43 \quad 50\]
\[48 \quad 20 \quad 45 \quad 49 \quad 47\]

(a) Work out

(i) the mode,

\[\text{Answer}(a)(i) \quad \text{cm}^2 \quad [1]\]

(ii) the mean,

\[\text{Answer}(a)(ii) \quad \text{cm}^2 \quad [2]\]

(iii) the median.

\[\text{Answer}(a)(iii) \quad \text{cm}^2 \quad [2]\]

(b) Explain why the mean is not a suitable average to represent this data.

\[\text{Answer}(b) \quad [1]\]
The graph shows the distance travelled by a cyclist on a journey from Home to Work.

(a) The cyclist stopped twice at traffic lights.

For how many seconds did the cyclist wait altogether?

Answer(a) ................................................. s [2]

(b) For which part of the journey did the cyclist travel fastest?

Answer(b) .................................................. [1]

(c) (i) How far did the cyclist travel from Home to Work?

Answer(c)(i) ............................................. m [1]

(ii) Calculate the cyclist’s average speed for the whole journey.

Answer(c)(ii) .............................................. m/s [3]
This document consists of 11 printed pages and 1 blank page.
1 Work out the value of $\frac{6-3\times12}{3\times2}$.

Answer ............................................ [1]

2 Write the following in order, with the smallest first.

$\frac{4}{5}$ 0.79 81%

Answer ............................................ < .......... < .......... [1]

3 Jamal arrived at work at 09:40 and left at 17:25.

How long, in hours and minutes, did he spend at work?

Answer ............................................ h ................................ min [1]

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A piece of wood is 150 centimetres long.

It has to be cut into equal lengths of $6\frac{1}{4}$ centimetres.

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(a) Which month has the lowest average temperature?

Answer(a) ........................................... [1]

(b) Find the difference between the average temperatures in February and October.

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The bearing of a lighthouse, L, from a port, P, is 125°.

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(a) Write $\vec{AB}$ as a column vector.

Answer (a) \[
\vec{AB} = \begin{pmatrix} \cdot \\
\cdot 
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\end{pmatrix}$.

Write down the co-ordinates of $C$.

Answer (b) ( ..........., ...........) [1]

9 Expand the brackets and simplify

\[4x^2 - x(x - 2y).\]

Answer ........................................... [2]
In the diagram, $AB$, $CD$ and $EF$ are parallel lines.

Angle $ABC = 35^\circ$ and angle $CEF = 135^\circ$.

Calculate angle $BCE$.

Answer Angle $BCE = \ldots$ [2]

11 The net of a solid is drawn accurately below.

Write down the special name for

(a) the triangles shown on the net,

Answer(a) \ldots [1]

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Answer(b) \ldots [1]
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\[ \text{Answer}\ y = \quad \] \[ \text{[2]} \]

13 (a) \(3^p \times 3^5 = 3^{14}\). Find the value of \(p\).

\[ \text{Answer(a)} \ p = \quad \] \[ \text{[1]} \]

(b) \(2^8 + 2^q = 2^3\). Find the value of \(q\).

\[ \text{Answer(b)} \ q = \quad \] \[ \text{[1]} \]

(c) \(6^r = \frac{1}{36}\). Find the value of \(r\).

\[ \text{Answer(c)} \ r = \quad \] \[ \text{[1]} \]

14 (a) Alex changed $270 into euros (€) when the rate was €1 = $1.19886. How many euros did he receive?

\[ \text{Answer(a)} \ € \quad \] \[ \text{[2]} \]

(b) Write 1.19886 correct to 3 significant figures.

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Answer $x = \ldots$ [3]

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17  (a) The surface area of the earth is approximately \(510\,000\,000\) square kilometres.

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A hot air balloon, \(B\), is 800 metres vertically above a point \(C\) on the ground.

A girl stands at a point \(A\), 1100 metres horizontally from \(C\).

(a) Calculate the distance, \(AB\), of the girl from the balloon.

\[
\text{Answer(a)} \ AB = \text{............................................... m} \quad [2]
\]

(b) Calculate the angle \(BAC\).

\[
\text{Answer(b)} \ Angle \ BAC = \text{...............................................} \quad [2]
\]
19 In triangle $LMN$, $LM = 120$ mm, $LN = 70$ mm and $MN = 86$ mm.

(a) Calculate the perimeter of the triangle $LMN$.

$$\text{Answer (a)} \quad \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \text{mm} \quad [1]$$

(b) Construct the triangle $LMN$, leaving in your construction arcs.

The side $LM$ is drawn for you.

(c) The side $LM$ is 120 mm, **correct to the nearest millimetre**.

Write down the shortest possible length of $LM$.

$$\text{Answer (c)} \quad \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \text{mm} \quad [1]$$
15 students estimated the area of the rectangle shown below.

Their estimates, in square centimetres were

45  44  50  50  51
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