

CANDIDATE NAME

CENTRE NUMBER

Cambridge International Examinations

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| | CANDIDATE NUMBER | |

MATHEMATICS 0580/23

May/June 2014 Paper 2 (Extended)

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator Geometrical instruments

Tracing paper (optional)

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer all questions.

If working is needed for any question it must be shown below that question.

Electronic calculators should be used.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

For π , use either your calculator value or 3.142.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total of the marks for this paper is 70.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

CAMBRIDGE International Examinations In March 2011, the average temperature in Kiev was 3°C.

1

| | In March 2 | 2012, the average | temperature in | Kiev was 19°C | lower than in Ma | arch 2011. | |
|---|--------------|---------------------|------------------|-------------------|------------------|------------|--------|
| | Write dow | n the average tem | perature in Kie | v in March 2012 | 2. | | |
| | | | | | Answer | | °C [1] |
| 2 | | ells ice cream. | of the different | flavours she sell | ls in one hour. | | |
| | | Flavour | Vanilla | Strawberry | Chocolate | Mango | |
| | | Number sold | 6 | 8 | 9 | 7 | |
| | Michelle v | vants to show this | information in | a pie chart. | | | |
| | Calculate t | the sector angle fo | or mango. | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | Answer | ••••• | [2] |
| 3 | Chris chan | iges \$1350 into et | uros (A whon A | T - \$1 212 | | | |
| 3 | | | | 1 — \$1.313. | | | |
| | Calculate | how much he rece | eives. | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | Anguar E | | [2] |
| | | | | | Answer C | | [2] |
| 4 | Factorise of | completely. | 2 ~ . | | | | |
| | | 15 <i>a</i> ° | 3-5ab | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | Answer | | [2] |
| | | | | | | | |

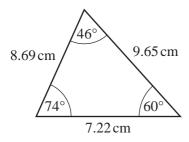
| 5 | (a) | Use your calculator to find the value of | $7.5^{-0.4} \div \sqrt{57}$. |
|---|-----|--|-------------------------------|
| | | Write down your full calculator display. | |

| Answer(a) | Г1` | l |
|---------------|---------|---|
| 11001101 (00) | 1 * | |

(b) Write your answer to part (a) in standard form.

6 Simplify. $3x^2y^3 \times x^4$

7



9.65 cm (x°) 46° ycm

NOT TO SCALE

These two triangles are congruent. Write down the value of

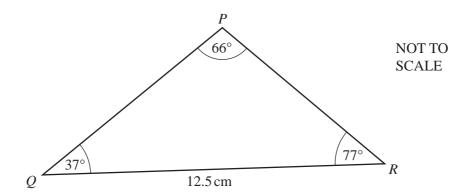
(a) *x*,

(b) y.

| 8 | Hans draws a plan of a field using a scale of 1 centimetre to represent 15 metres. The actual area of the field is $10800\mathrm{m}^2$. | | | | | |
|----|--|----------------------------|--|--|--|--|
| | Calculate the area of the field on the plan. | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | 2 | | | | |
| | | Answer cm ² [2] | | | | |
| 9 | Solve the inequality. $5t + 23 < 17 - 2t$ | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | Answer [2] | | | | |
| 10 | Without using a calculator, work out $1\frac{1}{4} - \frac{7}{9}$. | | | | | |
| | Write down all the steps in your working. | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | <i>Answer</i> [3] | | | | |
| | | | | | | |

| 11 | y varies as the cube root of $(x + 3)$. When $x = 5$, $y = 1$. | |
|----|---|-------|
| | Find the value of y when $x = 340$. | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | $Answer y = \dots$ | . [3] |
| 12 | (a) Factorise $3x^2 + 2x - 8$. | |
| | | |
| | | |
| | Answer(a) | . [2] |
| | (b) Solve the equation $3x^2 + 2x - 8 = 0$. | |
| | | |
| | | |
| | Answer(b) $x =$ or $x =$ | . [1] |
| 13 | Find the equation of the line passing through the points with co-ordinates (5, 9) and (-3, 13). | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | Answer | . [3 |

14



Calculate PR.

| Answer PR = | | cm | [3] |
|-------------|--|----|-----|
|-------------|--|----|-----|

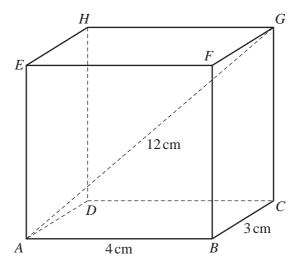
15 A rectangle has length 127.3 cm and width 86.5 cm, both correct to 1 decimal place.

Calculate the upper bound and the lower bound for the perimeter of the rectangle.

Answer Upper bound = cm

Lower bound = cm [3]

16



NOT TO SCALE

ABCDEFGH is a cuboid. AB = 4 cm, BC = 3 cm and AG = 12 cm.

Calculate the angle that AG makes with the base ABCD.

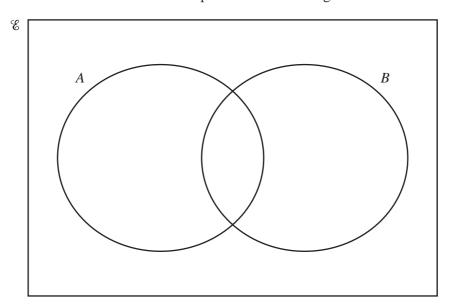
| Answer | | [/1] |
|---------|-------|------|
| THISWEI | ••••• | Į۳. |

17 $\mathscr{E} = \{x : 1 \le x \le 10, \text{ where } x \text{ is an integer}\}$

 $A = \{ \text{square numbers} \}$

$$B = \{1, 2, 3, 4, 5, 6\}$$

(a) Write all the elements of $\mathscr E$ in their correct place in the Venn diagram.



[2]

(b) List the elements of $(A \cup B)'$.

(c) Find $n(A \cap B')$.

 $\mathbf{A} = \begin{pmatrix} 5 & 2 \\ 4 & 3 \end{pmatrix}$

(a) Calculate A^2 .

Answer(a) [2]

(b) Calculate A^{-1} , the inverse of A.

Answer(b) [2]

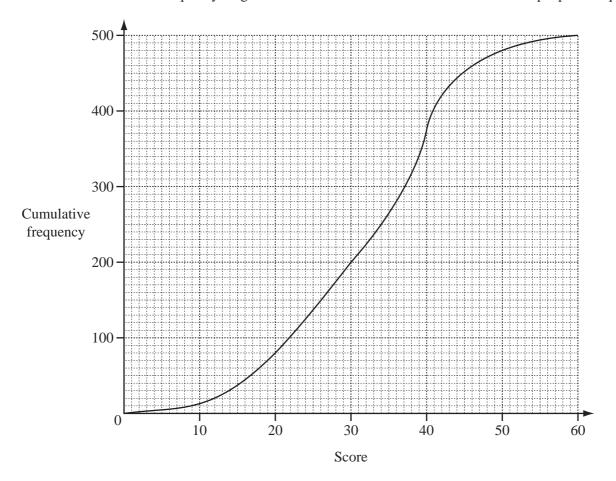
Robbie pays \$10.80 when he buys 3 notebooks and 4 pencils. Paniz pays \$14.50 when she buys 5 notebooks and 2 pencils.

Write down simultaneous equations and use them to find the cost of a notebook and the cost of a pencil.

Answer Cost of a notebook = \$.....

Cost of a pencil = \$..... [5]

20 Jenna draws a cumulative frequency diagram to show information about the scores of 500 people in a quiz.



Use the diagram to find

(a) the median score,

Answer(a) [1]

(b) the inter-quartile range,

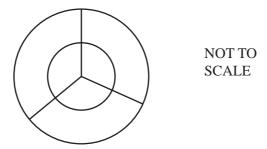
Answer(b) [2]

(c) the 40th percentile,

Answer(c) [1]

(d) the number of people who scored 30 or less but more than 20.

Answer(d) [1]

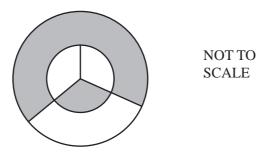


The diagram shows two concentric circles and three radii.

The diagram has rotational symmetry of order 3.

A club uses the diagram for its badge with some sections shaded.

The radius of the large circle is 6 cm and the radius of the small circle is 4 cm.

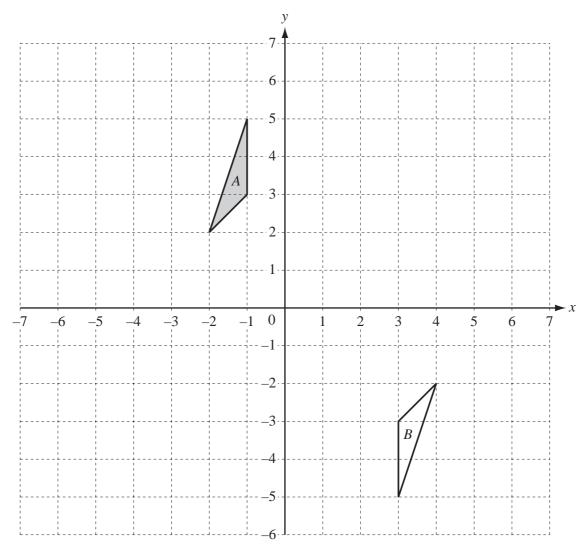


Calculate the total perimeter of the shaded area.

Answer cm [5]

Question 22 is printed on the next page.

22



- (a) Draw the image of triangle A after a translation by the vector $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$. [2]
- (b) Describe fully the **single** transformation which maps triangle A onto triangle B.

(c) Draw the image of triangle A after the transformation represented by the matrix $\begin{pmatrix} -2 & 0 \\ 0 & 1 \end{pmatrix}$. [3]

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