UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

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| CANDIDATE NAME | | | | | | | | | |
| CENTRE NUMBER | | | | | | CANDIDATE NUMBER | | | |

*3964003232*

**MATHEMATICS** **0581/13**

Paper 1 (Core) **October/November 2011**

**1 hour**

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Mathematical tables (optional)
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 a pencil for any diagrams or graphs.
Do not use staples, paper clips, highlighters, 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 $\pi$, 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 56.

This document consists of **12** printed pages.

*For Examiner's Use*

**1** During April the probability that it will rain on any one day is $\frac{5}{6}$.

On how many of the 30 days in April would it be expected to rain?

*Answer* ..... [1]

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**2** **(a)** Write, in figures, the number

one hundred and five thousand and two.

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

**(b)** Write your answer to **part (a)** correct to the nearest ten thousand.

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

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**3** Simplify the expression.

$7x + 11y + x - 6y$

*Answer* ..... [2]

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**4** Insert **one** pair of brackets into each calculation to make the answer correct.

**(a)** 7 × 6 – 3 + 5 = 26 [1]

**(b)** 8 – 6 × 4 – 1 = –10 [1]

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*For Examiner's Use*

**5** Write the following in order of size, starting with the smallest.

$0.525 \qquad \frac{11}{21} \qquad \frac{111}{211} \qquad 52.4\%$

*Answer* ..... < ..... < ..... < ..... [2]

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**6** Thomas fills glasses from a jug containing 2.4 litres of water.
Each glass holds 30 centilitres.

How many glasses can Thomas fill?

*Answer* ..... [2]

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**7** Martha divides \$240 between spending and saving in the ratio

spending : saving = 7 : 8 .

Calculate the amount Martha has for spending.

*Answer* \$ ..... [2]

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*For Examiner's Use*

**8** 210 211 212 213 214 215 216

From the list of numbers, find

**(a)** a prime number,

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

**(b)** a cube number.

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

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**9** Calculate the selling price of a bicycle bought for \$120 and sold at a profit of 15%.

*Answer* \$ ..... [2]

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**10** Solve the simultaneous equations.

$$x + 5y = 22$$
$$x + 3y = 12$$

*Answer* $x =$ .....

$y =$ ..... [2]

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*For Examiner's Use*

**11** Solve the equation.

$$\frac{2x-3}{2} = 2$$

*Answer* $x =$ ..... [2]

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**12** The population of a city is 128 000, correct to the nearest thousand.

**(a)** Write 128 000 in standard form.

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

**(b)** Write down the upper bound of the population.

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

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**13** Pedro invested \$800 at a rate of 5% per year **compound** interest.
Calculate the **total** amount he has after 2 years.

*Answer* \$ ..... [2]

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*For Examiner's Use*

**14** Factorise completely.

$$5g^2h + 10hj$$

*Answer* ..... [2]

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**15** For her holiday, Dina changed 500 Swiss francs (CHF) into pounds (£).
The rate was £1 = CHF 1.6734.

Calculate how much Dina received in pounds.
Give your answer correct to 2 decimal places.

*Answer* £ ..... [2]

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**16** Simplify

$$4x^4 \times 5x^5.$$

*Answer* ..... [2]

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*For Examiner's Use*

**17** The scale of a map is 1 : 500 000.
On the map the centres of two cities are 26 cm apart.

Calculate the actual distance, in kilometres, between the centres of the two cities.

*Answer* ..... km [2]

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**18** Show that $3^{-2} + 2^{-2} = \frac{13}{36}$.

Write down all the steps of your working.

*Answer*

[2]

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**19** In Vienna, the mid-day temperatures, in °C, are recorded during a week in December. This information is shown below.

–2 2 1 –3 –1 –2 0

Calculate

**(a)** the difference between the highest temperature and the lowest temperature,

*Answer(a)* ..... °C [1]

**(b)** the mean temperature.

*Answer(b)* ..... °C [2]

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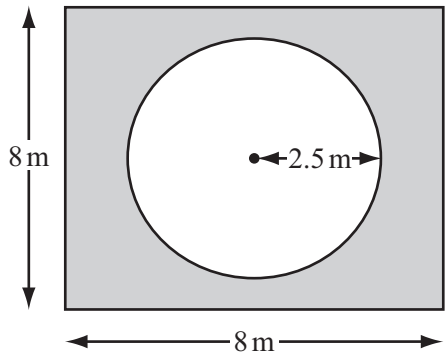
**20**




NOT TO SCALE

The diagram shows a circular pool of radius 2.5 m.
A square piece of land surrounds the pool.
Each side of the square is 8 m long.

Calculate the shaded area of the land that surrounds the pool.

*Answer* ..... $m^2$ [3]

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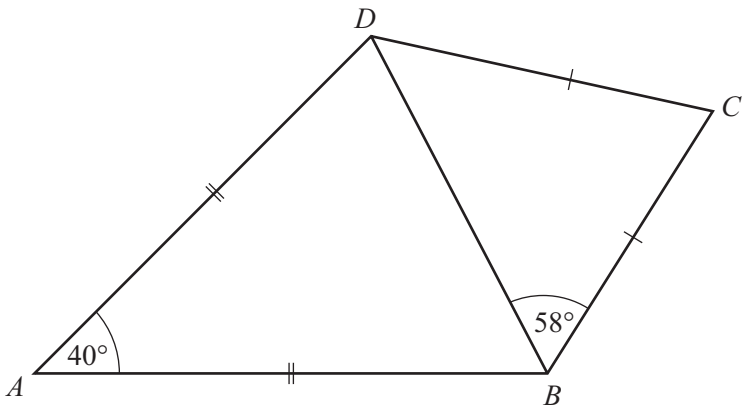
**21**






NOT TO SCALE

In the quadrilateral $ABCD$, $AB = AD$ and $CB = CD$.

Angle $BAD = 40°$ and angle $CBD = 58°$.

**(a)** Calculate

**(i)** angle $ABD$,

*Answer(a)*(i) Angle $ABD$ = ..... [1]

**(ii)** angle $BCD$.

*Answer(a)*(ii) Angle $BCD$ = ..... [1]

**(b)** Write down the mathematical name for the quadrilateral $ABCD$.

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

*For Examiner's Use*

**22** **(a)** Calculate $\frac{700}{28.6^3}$.

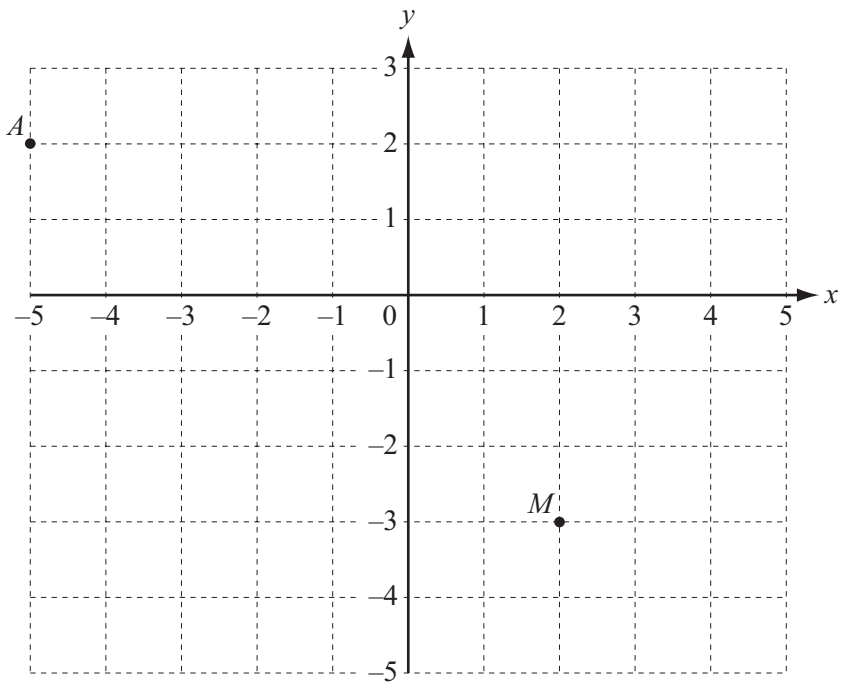
*Answer(a)* ..... [1]

**(b)** Work out $(8 \times 10^6)^2$, giving your answer in standard form.

*Answer(b)* ..... [2]

**23**

*For Examiner's Use*




The diagram shows two points $A$ (–5, 2) and $M$ (2, –3).

**(a)** $B$ is the point (5, –2).

**(i)** On the grid, mark the point $B$. [1]

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

*Answer(a)*(ii) $\overrightarrow{AB}$ = $\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

**(b)** $M$ is the midpoint of the line $BD$.

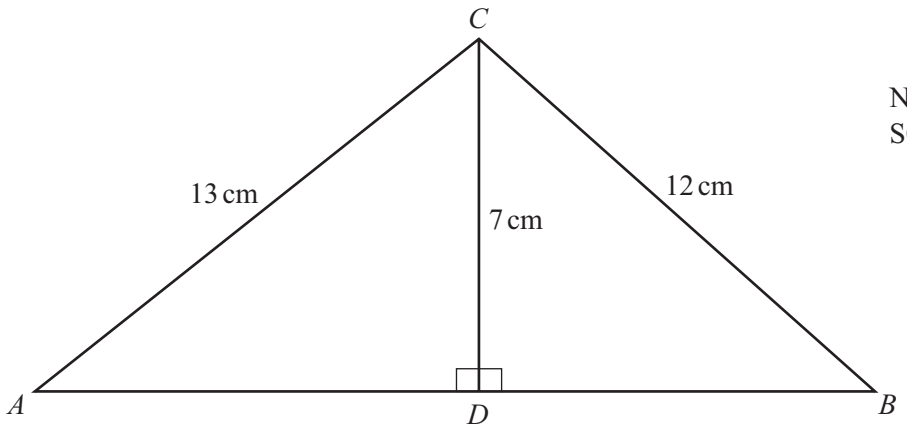
Find the co-ordinates of $D$.

*Answer(b)* ( ..... , ..... ) [2]

**Question 24 is printed on the next page.**

**24**

*For Examiner's Use*




In triangle $ABC$, $D$ is on $AB$ so that angle $ADC$ = angle $BDC$ = 90°.

$AC$ = 13 cm, $BC$ = 12 cm and $CD$ = 7 cm.

**(a)** Calculate the length of $DB$.

*Answer(a)* $DB$ = ..... cm [3]

**(b)** Use trigonometry to calculate angle $CAD$.

*Answer(b)* Angle $CAD$ = ..... [2]