**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**
International General Certificate of Secondary Education

**MATHEMATICS**

**0580/01 0581/01**

Paper 1 (Core)

Candidates answer on the Question Paper.
Additional Materials: Electronic calculator
Geometrical instruments    October/November 2005
Mathematical tables (optional)
Tracing paper (optional)    **1 hour**

Candidate Name

Centre Number

Candidate Number

**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 in the spaces provided on the Question Paper.

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 THE BARCODE.

DO **NOT** WRITE IN THE GREY AREAS BETWEEN THE PAGES.

Answer **all** questions.

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

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

The total number of marks for this paper is 56.

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.

**For Examiner's Use**

This document consists of **9** printed pages and **3** blank pages.

**UNIVERSITY** *of* **CAMBRIDGE**
International Examinations

**[Turn over**

**1** The distance from Buenos Aires to Wellington is approximately 10 100 kilometres.
Write this number in standard form.

*Answer* ........................................................ km [1]

**2** Factorise $3xy - 2x$.

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

**3** The highest mountain in Argentina is Aconcagua.
Its height is 6960 metres, correct to the nearest **twenty** metres.
Write down the smallest possible height of Aconcagua.

*Answer* ........................................................ m [1]

**4** Which one of the numbers below is **not** a rational number?

$$7 \qquad \tfrac{2}{3} \qquad \sqrt{5} \qquad -1\tfrac{1}{2} \qquad \sqrt{81}$$

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

**5** Solve the equation $5x - 7 = 8$.

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

**6** A bottle of lemonade contains $1\tfrac{1}{2}$ litres.

A glass holds $\tfrac{1}{8}$ litre.

How many glasses can be filled from one bottle of lemonade?

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

**7** The table below shows the average monthly temperatures (°C) in the Islas Orcadas, Argentina.

| Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|-----|-----|-----|-----|-----|------|------|-----|------|-----|-----|-----|
| 1 | 1 | 0.5 | −1 | −5 | −8 | −9 | −8 | −5 | −3 | −1 | 0.5 |

**(a)** Work out the difference between the highest and the lowest average monthly temperature.

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

**(b)** The highest recorded temperature for July is $x$ °C.
This is 21 °C above the average for July shown in the table.
Work out the value of $x$.

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

**8** The formula for the perimeter, $P$, of a rectangle with length $a$ and width $b$ is

$$P = 2a + 2b.$$

Make $a$ the subject of the formula.

*Answer a =* ............................................... [2]

**9** 0.072    72%    0.702    $\frac{7}{10}$    $\frac{7}{100}$    7.2%

From the values listed above, write down

**(a)** the smallest,

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

**(b)** the largest,

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

**(c)** the two which are equal.

*Answer(c)* ...................... and ...................... [1]

**10** An integer $n$ is such that $60 \leqslant n \leqslant 70$.
Write down a value of $n$ which is

**(a)** a prime number,

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

**(b)** a multiple of 9,

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

**(c)** a square number.

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

**11**

$$\mathbf{p} = \begin{pmatrix} 2 \\ -3 \end{pmatrix} \text{ and } \mathbf{q} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}.$$

**(a)** Write $\mathbf{p} + \mathbf{q}$ as a column vector.

*Answer (a)* $\mathbf{p} + \mathbf{q} = \begin{pmatrix} \phantom{0} \\ \phantom{0} \end{pmatrix}$ [2]
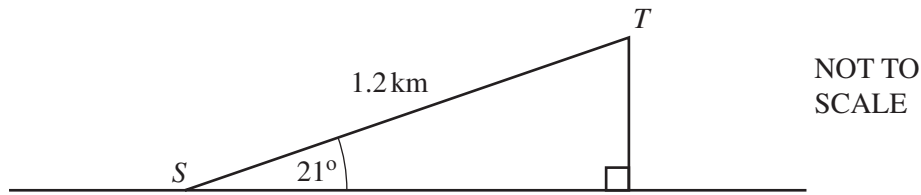
**(b)** The point $O$ is marked on the grid below.

Draw the vector $\overrightarrow{OP}$ where $\overrightarrow{OP} = \mathbf{p}$.



[1]

**12**

NOT TO
SCALE

1.2 km

*T*

*S*  21°
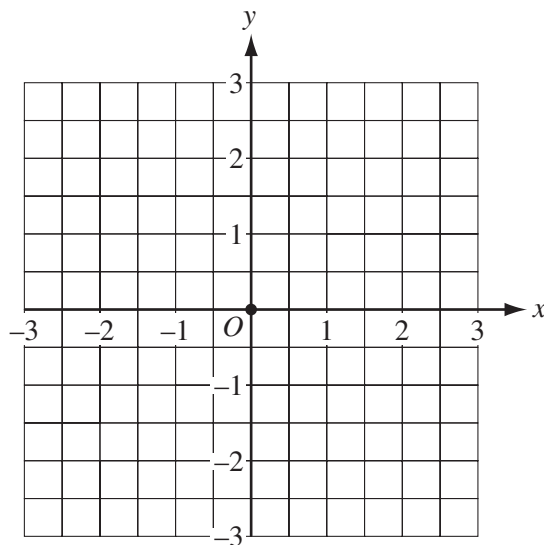
The diagram shows a path, *ST*, up a hill.
The path is 1.2 kilometres long and slopes at an angle of 21° to the horizontal.

Calculate the height of the hill, showing all your working.
Give your answer in **metres**.

*Answer* ........................................................... m [3]

**13**  The population of Latvia in 1989 was 2 700 000.
In 1994 it was 2 500 000.

Calculate the percentage **decrease** in the population between 1989 and 1994.

*Answer* ........................................................... % [3]

**14**                        =        <        >

Choose one of the symbols given above to complete each of the following statements.

When *x* = 6 and *y* = –7, then

*(a) x* ..................... *y* [1]

*(b) x²* ..................... *y²* [1]

*(c) y* - *x* ..................... *x* - *y* [1]

**15 (a)** Write 0.48 correct to 1 significant figure.

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

**(b) (i)** Find an approximate answer for the sum

$$9.87 - 5.79 \times 0.48$$

by rounding each number to 1 significant figure. Show your working.

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

**(ii)** Use your calculator to find the exact answer for the sum in **part (b) (i)**.
Write down all the figures on your calculator.

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

**16** Simplify the following expressions.

**(a)** $9r - 4s - 6r + s$

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

**(b)** $q^4 \div q^3$

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

**(c)** $p^6 \times p^{-2}$

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

**17** Three friends, Cleopatra, Dalila and Ebony go shopping.
The money they each have is in the ratio
$$\text{Cleopatra : Dalila : Ebony} = 5 : 7 : 8.$$
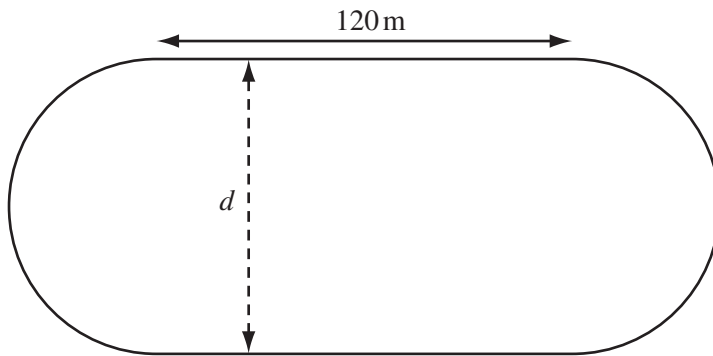Cleopatra has $15.

**(a)** How many dollars do they have in total?

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

**(b)** Dalila spends $12 on a hat.
How many dollars does she have left?

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

**18** A 400 metre running track has two straight sections, each of length 120 metres, and two semicircular ends.

120 m

*d*

NOT TO SCALE

**(a)** Calculate the **total** length of the **curved** sections of the track.

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

**(b)** Calculate *d*, the distance between the parallel straight sections of the track.

*Answer(b) d =* .................................................. m [2]

**19** Joseph buys 45 kilograms of potatoes from a supplier for $0.65 per kilogram.
**(a)** How much does he pay for the potatoes?

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

**(b)** He then puts the potatoes into bags which each hold 2.5 kilograms.
How many bags can he fill with the potatoes?

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

**(c)** At the market he sells the bags of potatoes for $2.20 per bag.
Calculate the smallest number of **complete** bags he needs to sell in order to make a profit.

*Answer(c)* .................................................. bags [2]

**20**
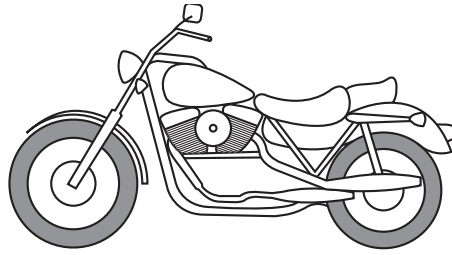
$900

Lorenzo saves money for a motorbike.
The marked price of the motorbike is $900.
He pays a deposit of 35% of the marked price.
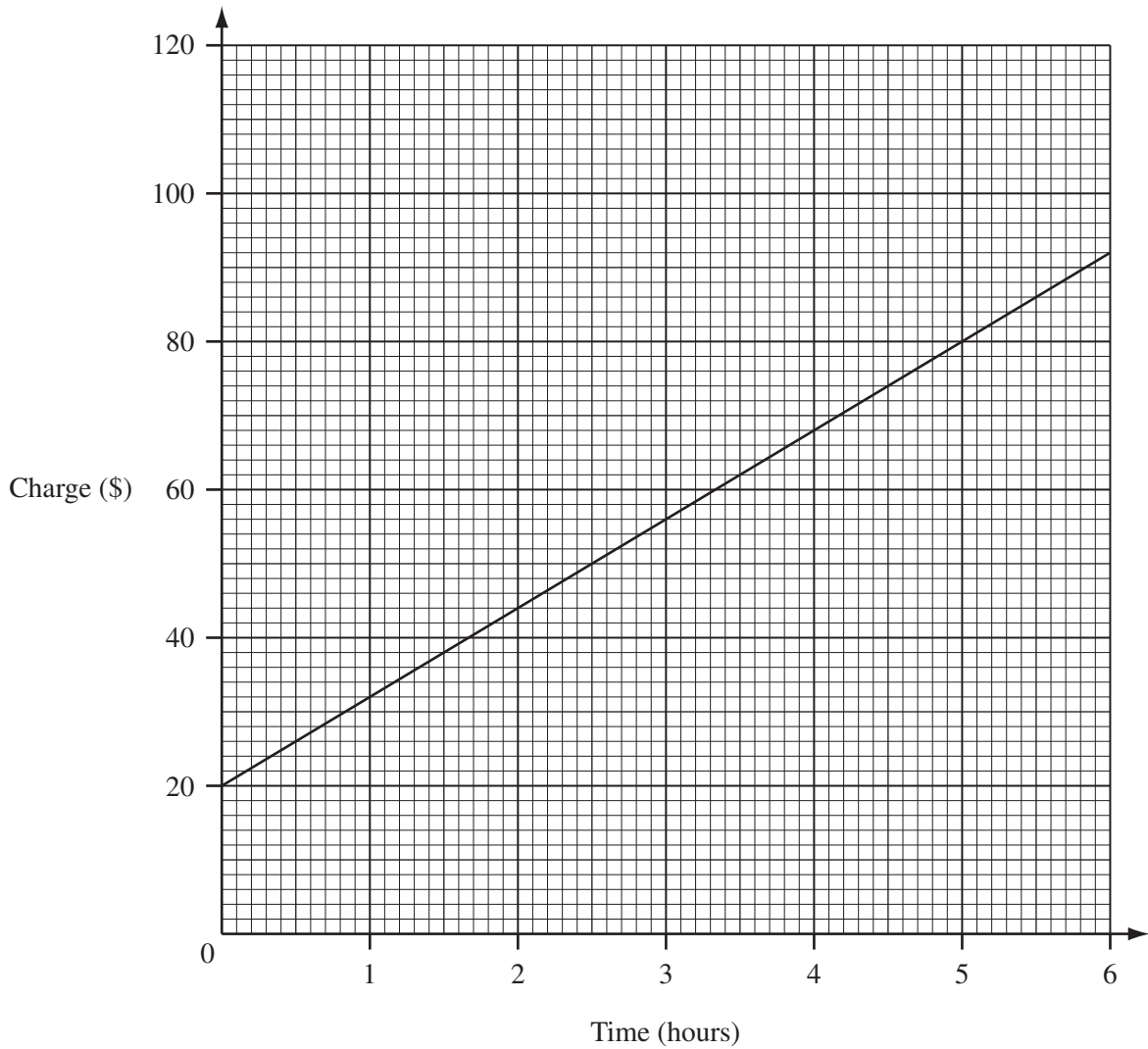
**(a)** Calculate his deposit.

*Answer(a)* $............................................... [2]

**(b)** He then makes 12 monthly payments of $60 each.
How much more than the $900 marked price does he pay altogether?

*Answer(b)* $............................................... [3]

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**21** The graph below shows the amount a plumber charges for up to 6 hours work.



**(a)** How much does he charge for $3\frac{1}{2}$ hours work?

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

**(b)** The plumber charged \$50.
How many hours did he work?

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

**(c)** Another plumber charges \$16 per hour.

**(i)** Draw a line on the grid above to show his charges. Start your line at (0,0). [2]

**(ii)** Write down the number of hours for which the two plumbers charge the same amount.

*Answer(c)*(ii) .........................................hours [1]

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**12**

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