UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS   **0580/12**

Paper 1 (Core)   **October/November 2009**

                                                                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.

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 56.

For Examiner's Use

This document consists of **11** printed pages and **1** blank page.

UNIVERSITY *of* CAMBRIDGE
International Examinations

[Turn over

1 Insert one pair of brackets to make the following equation correct.

$$2 \times 8 - 5 - 4 = 15$$

[1]

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2 Write the following numbers in order starting with the smallest.

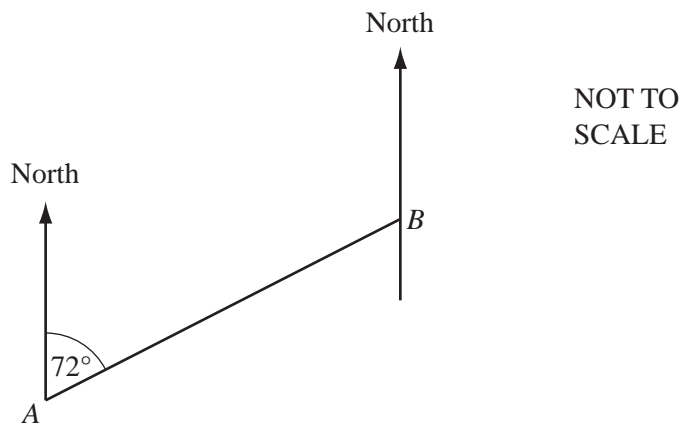$$\frac{2}{7} \qquad 0.283 \qquad 28\%$$

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

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3 Find the volume of a cube with sides of 3.8 cm.

Answer .... cm^3 [1]

4

The diagram shows the position of two airports, *A* and *B*.
The bearing of *B* from *A* is 072°.
Work out the bearing of *A* from *B*.

Answer .... [2]

5 The number of spectators, *N*, at a football match is 16 000, correct to the nearest thousand.
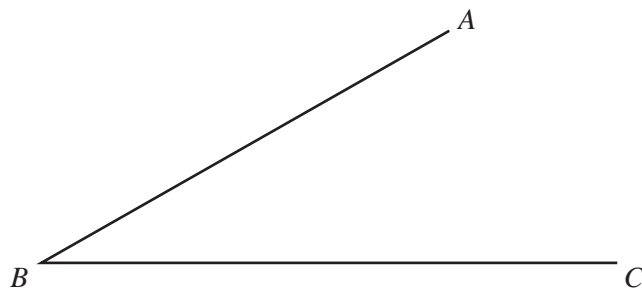Complete the inequality for *N* in the answer space.

Answer .... $\leqslant N <$ .... [2]

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6 Work out the value of $2\frac{2}{3} \times 1\frac{1}{11}$.

Show all your working and leave your answer as a fraction.

Answer .... [2]

7

Using a straight edge and compasses only, construct the locus of points which are equidistant from
AB and from *BC*.
Show clearly all your construction arcs.   [2]

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8 4 $\sqrt{8}$ $\sqrt{25}$ $\dfrac{5}{2}$ 0.3333

From the list above, write down

(a) a prime number,

Answer(a) .... [1]

(b) an irrational number.

Answer(b) .... [1]

9 A train sets off at 10 48 on a journey to Mumbai.
The journey takes 4 hours 30 minutes.

(a) Write down the time when the train arrives in Mumbai.

Answer(a) .... [1]

(b) The distance to Mumbai is 441 kilometres.
Calculate the average speed of the train.

Answer(b) .... km/h [2]

10 Solve the simultaneous equations

$$5x - 3y = 3,$$
$$6x - y = 14.$$

Answer x = ...

y = ... [3]

11
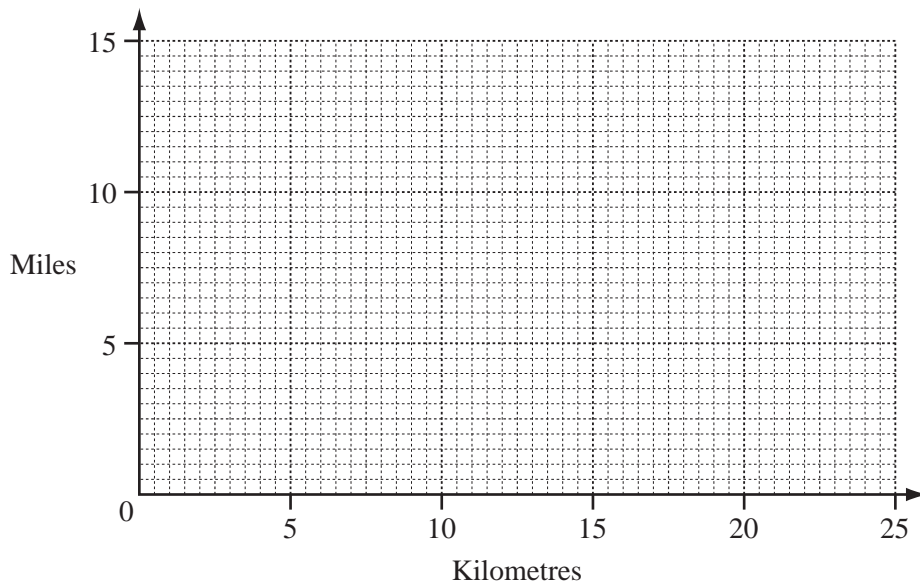
Distance can be measured in miles or kilometres. 24 kilometres is approximately equal to 15 miles.
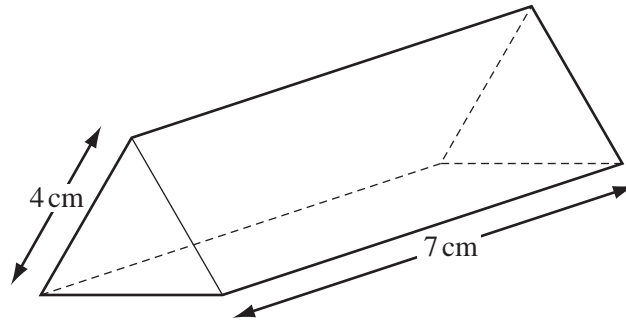
(a) Draw a straight line on the grid to show the conversion between kilometres and miles. [2]

(b) Use your graph to estimate the number of kilometres equal to 7 miles.

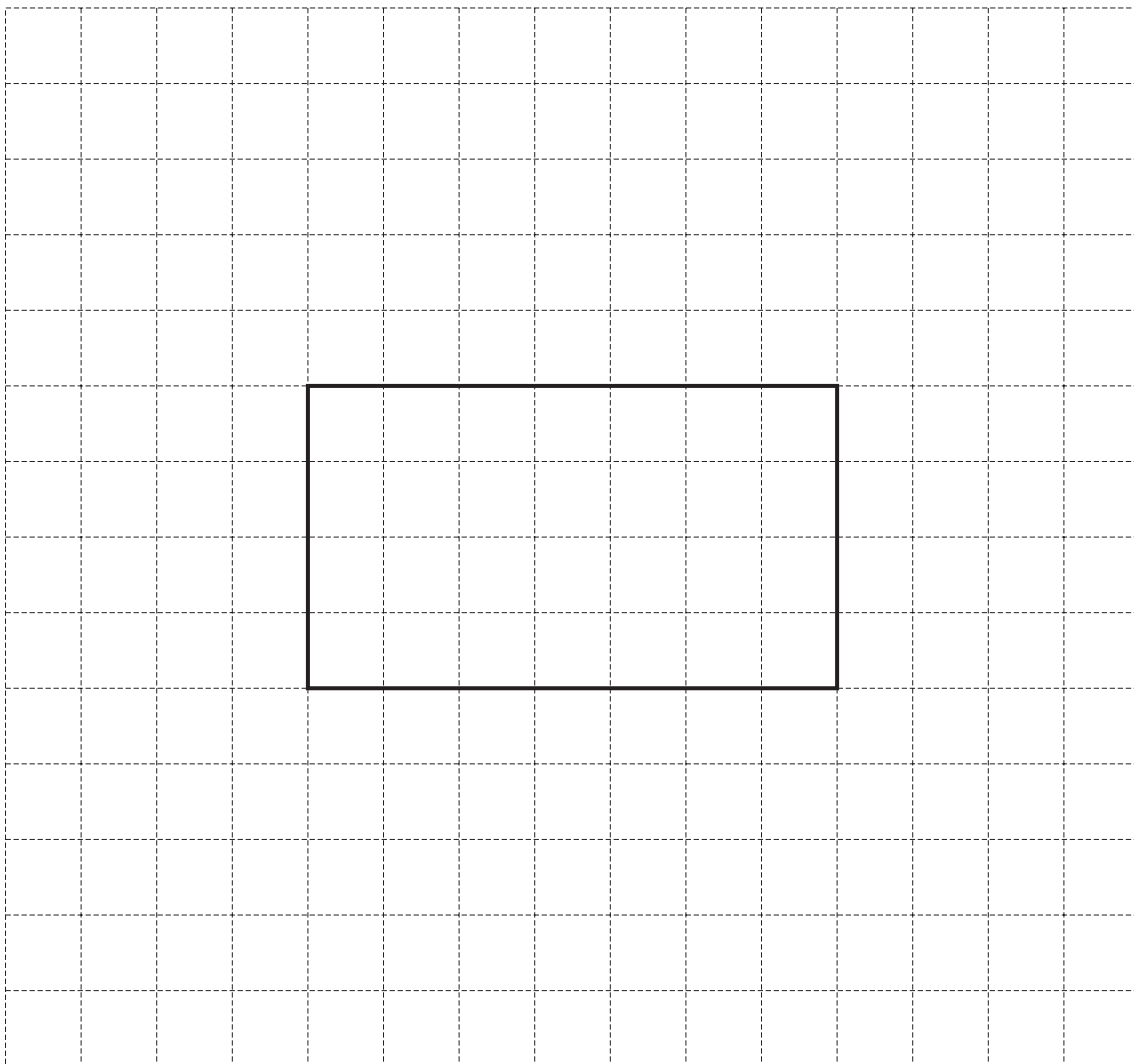*Answer (b)* .... km [1]
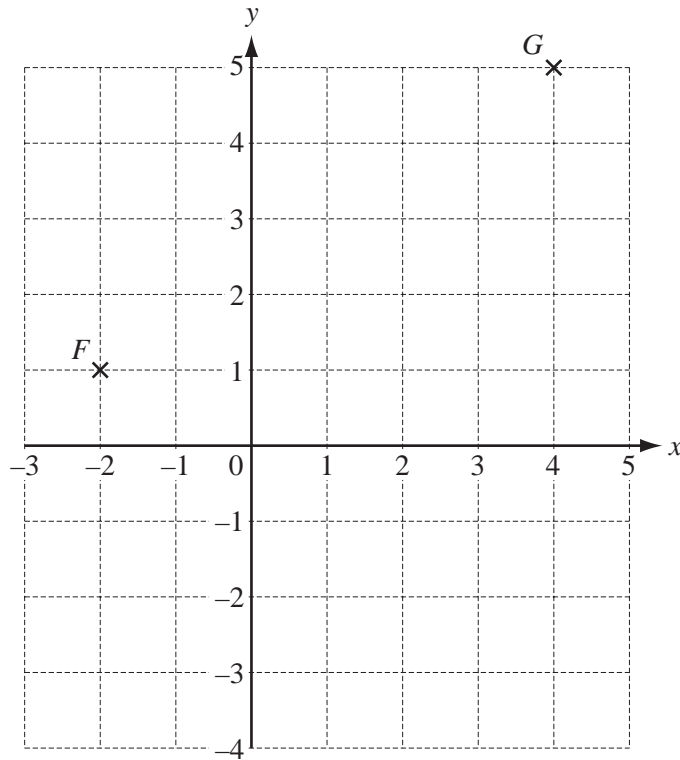
12

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4 cm

7 cm

The diagram shows a triangular prism of length 7 cm.
The cross-section is an equilateral triangle of side 4 cm.
Complete an **accurate** net of the prism.
One rectangular face has been drawn for you.

[3]

13

The points F and G are shown on the grid.

(a) Write down the co-ordinates of the point F.

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

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

Answer(b) $\overrightarrow{FG}$ = $\begin{pmatrix} & \\ & \end{pmatrix}$

[1]

(c) $\overrightarrow{GH} = \begin{pmatrix} -5 \\ -3 \end{pmatrix}$. Mark and label the point H on the grid. [1]

14 (a) Find the value of p when $p^3 = -27$.

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

(b) Find the value of q when $q^{-1} = \dfrac{1}{6}$.

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

(c) Simplify $8s^2 \div 2s^{-1}$.

Answer(c) .... [2]

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15 $$J = \frac{md}{3}$$

(a) Find the value of d when $J = 32$ and $m = 8$.

Answer(a) d = ... [2]

(b) Make d the subject of the formula.

Answer(b) d = [2]

16 As the earth rotates, a point on the equator moves round at a speed of 1669.8 kilometres/hour.

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  (a) Write down this number in standard form, correct to 3 significant figures.

Answer(a) .... [2]

  (b) Change 1669.8 kilometres/hour into metres/second.

Answer(b) .... m/s [2]

17 (a) Factorise $3mp + 7p^2$.

Answer (a) .... [1]

  (b) Simplify completely $8(3m + p) - 5(2m - 3p)$.

Answer (b) .... [3]

18

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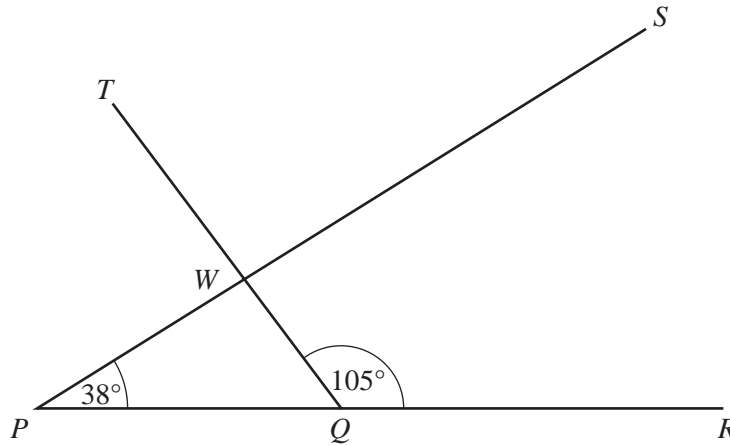
The lines *PS* and *QT* intersect at *W*.
PQR is a straight line.
Angle *SPR* = 38° and angle *TQR* = 105°.

Write down the size of the following angles.
In each case give a reason for your answer.

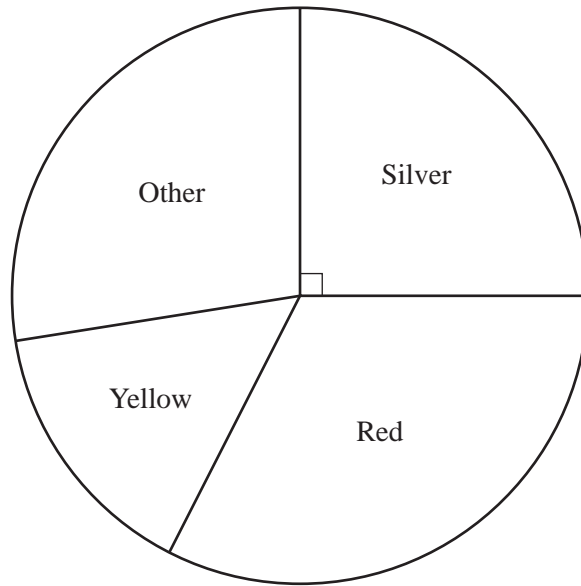**(a)** Angle *PQW* = ...because ....

.... [2]

(b) Angle *PWQ* = ...because ....

.... [2]

(c) Angle *TWS* = ...because ....

.... [2]

19

The accurate pie chart shows information about the colours of 240 cars in a car park.

(a) The sector angle for silver cars is 90°.
Calculate the number of silver cars in the car park.

Answer(a) .... [1]

(b) There are 36 yellow cars in the car park.
Showing all your working, calculate the sector angle for yellow cars.

Answer(b) .... [2]

(c) (i) Measure and write down the sector angle for red cars.

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

(ii) Calculate the percentage of red cars in the car park.

Answer(c)(ii) .... % [2]

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