Centre Number | Candidate Number

Candidate Name ________________________

CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

MATHEMATICS **0580/2, 0581/2**

PAPER 2

OCTOBER/NOVEMBER SESSION 2002

1 hour 30 minutes

Candidates answer on the question paper.
Additional materials:
Electronic calculator
Geometrical instruments
Mathematical tables (optional)
Tracing paper (optional)

TIME 1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

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

INFORMATION FOR CANDIDATES

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.

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.

FOR EXAMINER'S USE

This question paper consists of 11 printed pages and 1 blank page.

SP (SLC/DG) S17440/2

University of Cambridge Local Examinations Syndicate

[Turn over

1 The table shows the maximum daily temperatures during one week in Punta Arenas.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
2°C	3°C	1°C	2.5°C	–1.5°C	1°C	2°C

(a) By how many degrees did the maximum temperature change between Thursday and Friday?

Answer (a) .... [1]

(b) What is the difference between the greatest and the least of these temperatures?

Answer (b) .... [1]

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2 Nyali paid \$62 for a bicycle. She sold it later for \$46.
What was her percentage loss?

Answer ....% [2]

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3 Three sets A, B and K are such that $A \subset K$, $B \subset K$ and $A \cap B = \varnothing$.
Draw a Venn diagram to show this information.

[2]

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4 Alejandro goes to Europe for a holiday.
He changes 500 pesos into euros at an exchange rate of 1 euro = 0.975 pesos.
How much does he receive in euros? Give your answer correct to 2 decimal places.

Answer ....euros [2]

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5 Write the four values in order, smallest first.

$\frac{1}{1000}$, $\frac{11}{1000}$, 0.11%, 0.0108.

Answer …………….. < …………….. < …………… < …………… [2]

For Examiner's Use

6 Write $2x - \dfrac{10x}{5-x}$ as a single fraction.

Answer .... [2]

7 Find the **exact** value of

(a) 3^{-2},

Answer (a) .... [1]

(b) $\left(1\frac{7}{9}\right)^{\frac{1}{2}}$.

Answer (b) .... [2]

8 The length of a road is 380 m, correct to the nearest 10 m.
Maria runs along this road at an average speed of 3.9 m/s.
This speed is correct to 1 decimal place.
Calculate the greatest possible time taken by Maria.

Answer .... s [3]

9 **(a)** Draw a quadrilateral which has rotational symmetry of order 2 and whose diagonals are equal in length.

[2]

(b) Write down the special name of this quadrilateral.

Answer (b) .... [1]

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10 For the numbers 8, 3, 5, 8, 7, 8 find

(a) the mode,

Answer (a) .... [1]

(b) the median,

Answer (b) .... [1]

(c) the mean.

Answer (c) .... [1]

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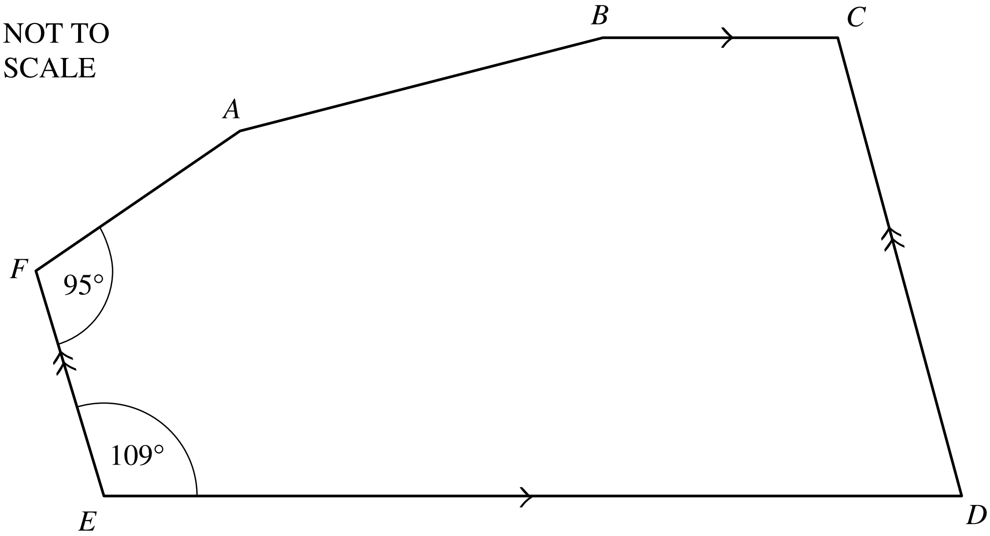
11 The radius of the Earth at the equator is approximately 6.4×10^6 metres.
Calculate the circumference of the Earth at the equator. Give your answer in standard form, correct to 2 significant figures.

Answer ....m [3]

For Examiner's Use

12

NOT TO SCALE



In the hexagon *ABCDEF*, *BC* is parallel to *ED* and *DC* is parallel to *EF*.
Angle *DEF* = 109° and angle *EFA* = 95°.
Angle *FAB* is equal to angle *ABC*.
Find the size of

(a) angle *EDC*,

Answer (a) Angle *EDC* = ... [1]

(b) angle *FAB*.

Answer (b) Angle *FAB* = ... [2]

[Turn over

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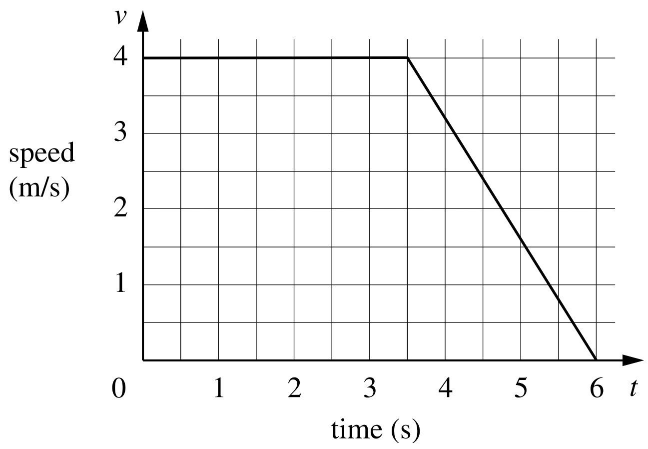

Ameni is cycling at 4 metres per second.
After 3.5 seconds she starts to decelerate and after a further 2.5 seconds she stops.
The diagram shows the speed-time graph for Ameni.
Calculate

(a) the constant deceleration,

Answer (a) ....m/s^2 [1]

(b) the total distance travelled during the 6 seconds.

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

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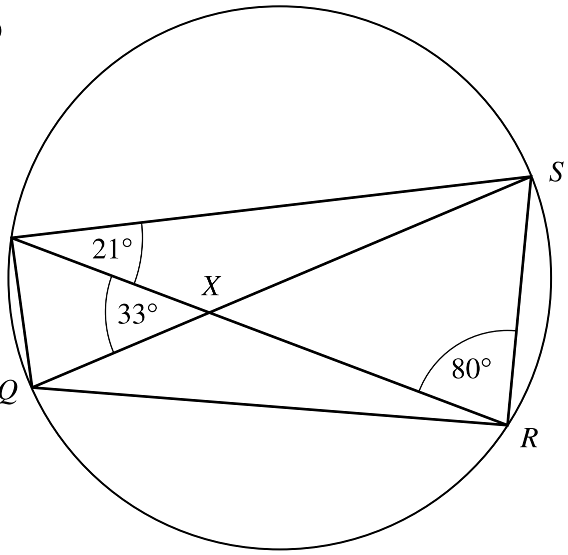

PQRS is a cyclic quadrilateral. The diagonals *PR* and *QS* intersect at *X*.
Angle *SPR* = 21°, angle *PRS* = 80° and angle *PXQ* = 33°.
Calculate

(a) angle *PQS*,

Answer (a) Angle *PQS* = ... [1]

(b) angle *QPR*,

Answer (b) Angle *QPR* = ... [1]

(c) angle *PSQ*.

Answer (c) Angle *PSQ* = ... [1]

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15 Solve the simultaneous equations

$$4x + 5y = 0,$$
$$8x - 15y = 5.$$

Answer x = ...

y = ... [4]

16 From a harbour, H, the bearing of a ship, S, is 312°. The ship is 3.5 km from the harbour.

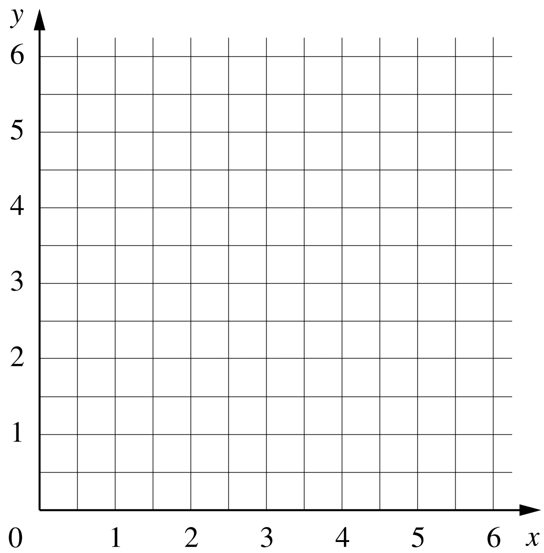
(a) Draw a sketch to show this information.
Label H, S, the length 3.5 km and the angle 312°.

[2]

(b) **Calculate** how far north the ship is of the harbour.

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

17



(a) On the grid, draw the lines $x = 1$, $y = 2$ and $x + y = 5$. [3]

(b) Write R in the region where $x \geqslant 1$, $y \geqslant 2$ and $x + y \geqslant 5$. [1]

For Examiner's Use

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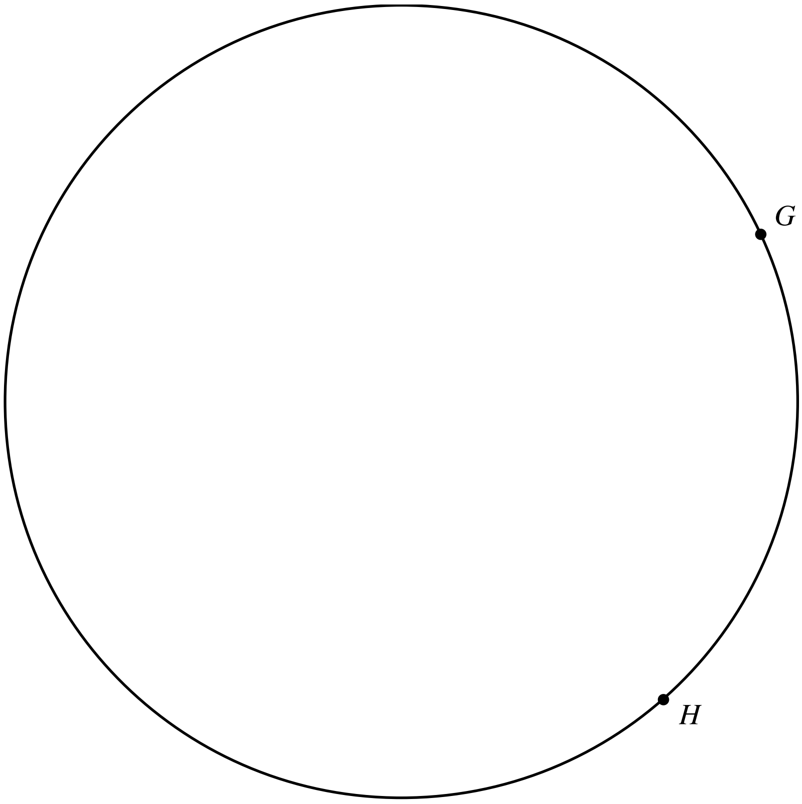

Find, by using **accurate** constructions, the region inside the circle which contains the points more than 5 cm from *G* **and** nearer to *H* than to *G*. Shade this region. [4]

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19 **(a)** Solve the inequality $5 - \frac{2x}{3} > \frac{1}{2} + \frac{x}{4}$.

Answer (a) x .... [3]

(b) List the positive integers which satisfy the inequality

$$5 - \frac{2x}{3} > \frac{1}{2} + \frac{x}{4}.$$

Answer (b) .... [1]

[Turn over

For Examiner's Use

20 f: $x \to 2x - 1$ and g: $x \to x^2 - 1$.
Find, in their simplest forms,

(a) $f^{-1}(x)$,

Answer (a) $f^{-1}(x)$ = ... [2]

(b) gf(x).

Answer (b) gf(x) = ... [2]

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21 $\mathbf{A} = \begin{pmatrix} 2 & -1 \\ 1 & 1 \end{pmatrix}$.

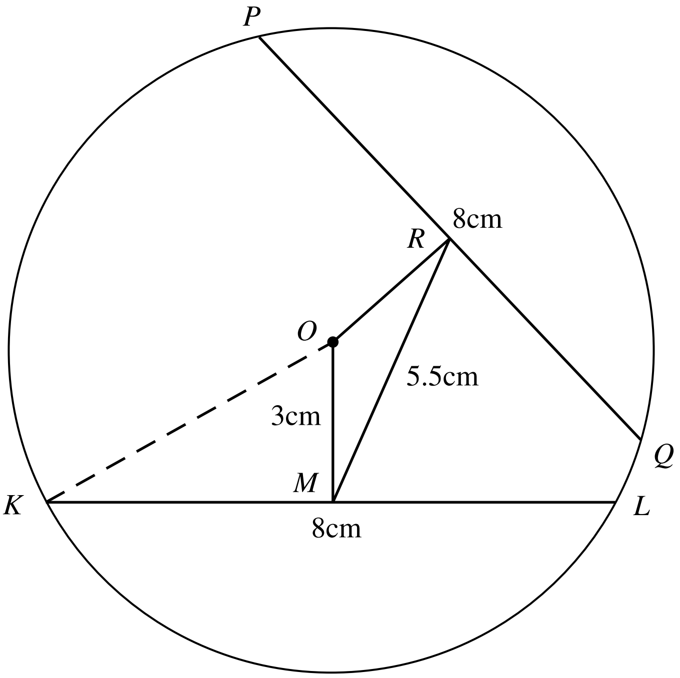
(a) Find the 2×2 matrix **P**, such that $\mathbf{A} + \mathbf{P} = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$,

Answer (a) **P** = $\begin{pmatrix} & \\ & \end{pmatrix}$ [2]

(b) Find the 2×2 matrix **Q**, such that $\mathbf{AQ} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$.

Answer (b) **Q** = $\begin{pmatrix} & \\ & \end{pmatrix}$ [3]

22



In the circle, centre *O*, the chords *KL* and *PQ* are each of length 8 cm.
M is the mid-point of *KL* and *R* is the mid-point of *PQ*. *OM* = 3 cm.

(a) Calculate the length of *OK*.

Answer (a) OK = ...cm [2]

(b) *RM* has a length of 5.5 cm. Calculate angle *ROM*.

Answer (b) Angle *ROM* = ... [3]

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