

Candidate Name _____

Centre Number

Candidate
Number

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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

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



- 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]

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

Answer% [2]

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

[2]

- 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.

Answereuros [2]

- 5 Write the four values in order, smallest first.

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

Answer < < < [2]

- 6 Write $2x - \frac{10x}{5-x}$ 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 10m .
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]

- 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.

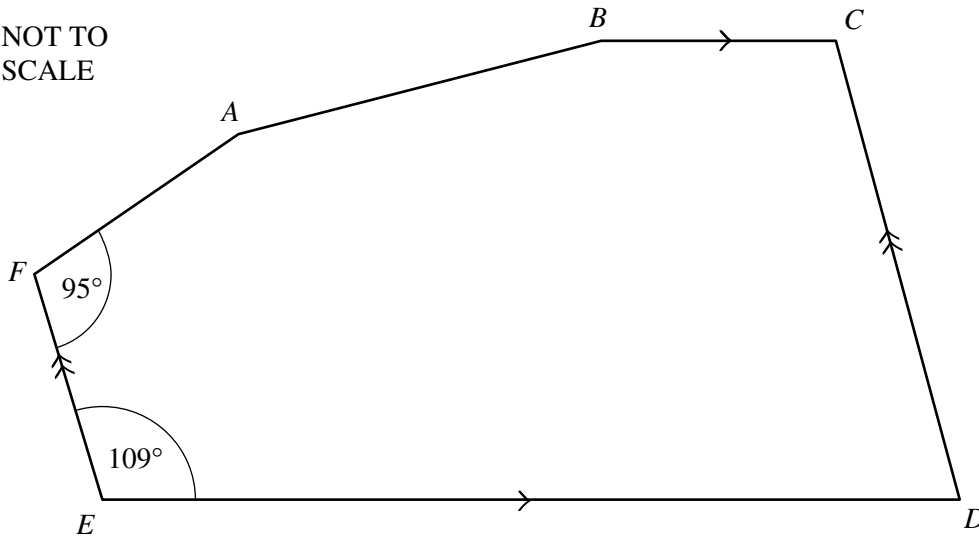
Answer (c) [1]

- 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.

Answerm [3]

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NOT TO
SCALE



In the hexagon $ABCDEF$, BC is parallel to ED and DC is parallel to EF .

Angle $DEF = 109^\circ$ and angle $EFA = 95^\circ$.

Angle FAB is equal to angle ABC .

Find the size of

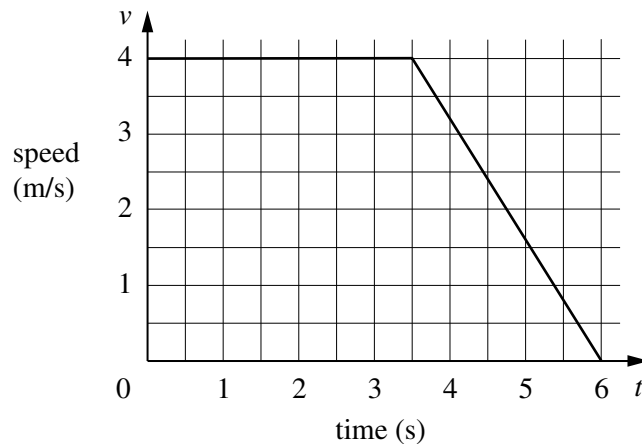
(a) angle EDC ,

Answer (a) Angle $EDC = \dots\dots\dots$ [1]

(b) angle FAB .

Answer (b) Angle $FAB = \dots\dots\dots$ [2]

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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

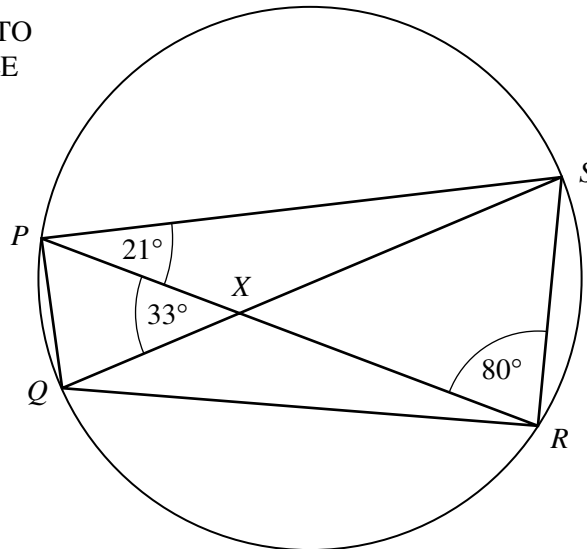
(a) the constant deceleration,

Answer (a)m/s² [1]

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

Answer (b)m [2]

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NOT TO
SCALE

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

(a) angle PQS ,

Answer (a) Angle $PQS = \dots\dots\dots$ [1]

(b) angle QPR ,

Answer (b) Angle $QPR = \dots\dots\dots$ [1]

(c) angle PSQ .

Answer (c) Angle $PSQ = \dots\dots\dots$ [1]

15 Solve the simultaneous equations

$$\begin{aligned} 4x + 5y &= 0, \\ 8x - 15y &= 5. \end{aligned}$$

Answer $x = \dots\dots\dots$

$y = \dots\dots\dots$ [4]

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

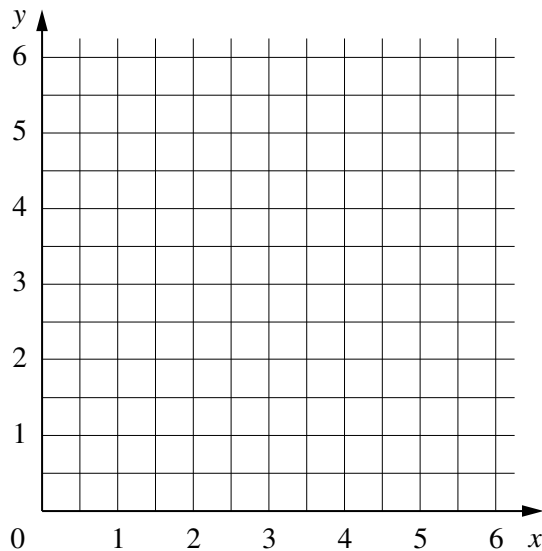
- (a) Draw a sketch to show this information.
Label H , S , the length 3.5 km and the angle 312° .

[2]

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

Answer (b)km [2]

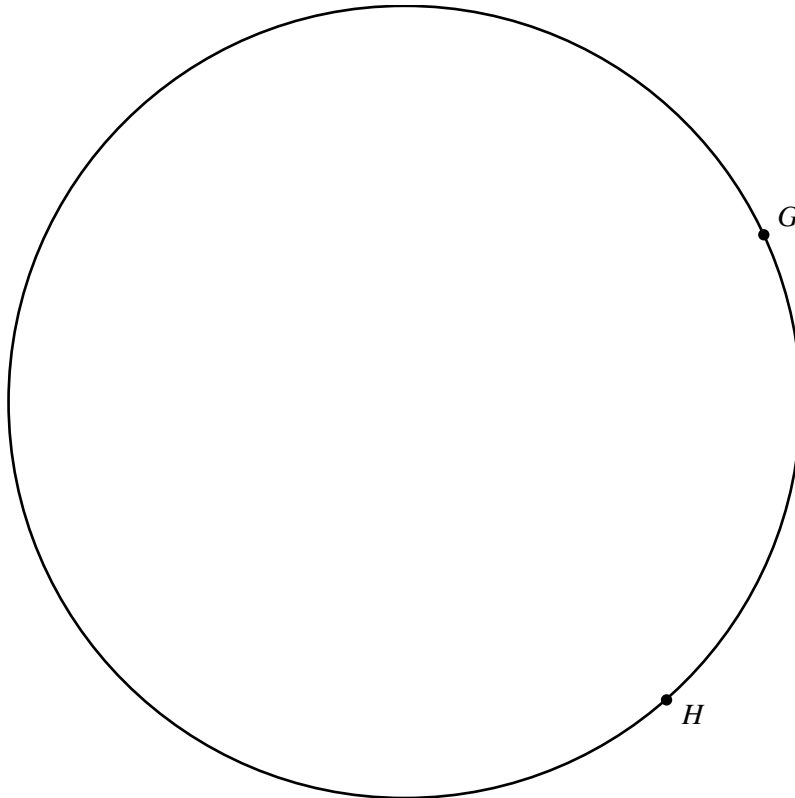
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- (a) On the grid, draw the lines $x = 1$, $y = 2$ and $x + y = 5$. [3]

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

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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]

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]

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

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

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

(b) $gf(x)$.

Answer (b) $gf(x) = \dots\dots\dots$ [2]

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

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

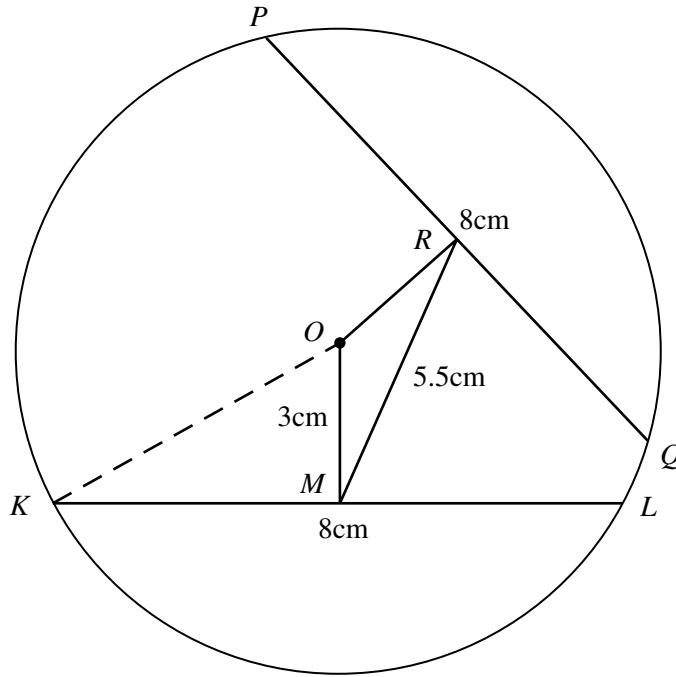
Answer (a) $\mathbf{P} = \begin{pmatrix} & \\ & \end{pmatrix}$ [2]

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

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

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NOT TO
SCALE



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) $OK = \dots\dots\dots$ cm [2]

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

Answer (b) Angle $ROM = \dots\dots\dots$ [3]

