Centre Number	Candidate Number

Candidate Name _____

International General Certificate of Secondary Education
UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE

MATHEMATICS 0580/2, 0581/2

PAPER 2

Friday **3 NOVEMBER 2000** Morning 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, the answer should be given to three significant figures. Answers in degrees should be given 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.

[Turn over

1 Work out $7 - 5 \times (6 - 1)$.

Answer ..... [1]

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2 Make h the subject of the formula $g = \sqrt{h + i}$.

Answer $h =$ ..... [2]

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3 Find the value of $\left(\frac{9}{4}\right)^{-\frac{3}{2}}$, giving your answer as an **exact fraction**.

Answer ..... [2]

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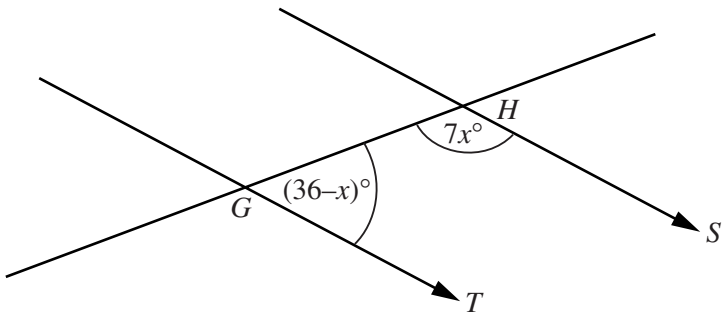
4 **Showing all your working**, calculate $1\frac{1}{4} \div \frac{2}{3} - 1\frac{1}{3}$.

Answer ..... [2]

5

NOT TO SCALE

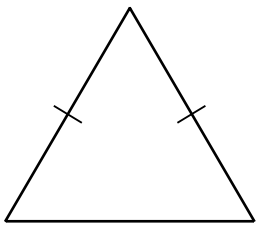


In the diagram GT is parallel to HS.
Angle $HGT = (36 - x)°$ and angle $GHS = 7x°$.
Find the value of x.

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

6

NOT TO SCALE



The equal sides of the isosceles triangle are each 7.7 cm, correct to the nearest millimetre.
The perimeter is 21.7 cm, also correct to the nearest millimetre.
Calculate the **smallest** possible length of the third side of the triangle. Show your working.

Answer .....cm [2]

---

7 Solve the simultaneous equations $2x - y = 81$,
$x + 2y = 23$.

Answer $x =$ .....

$y =$ ..... [3]

---

8 Anne-Françoise took part in a charity walk.
She walked 43.4 km at an average speed of 2.8 km/h.

(a) For how long did she walk?

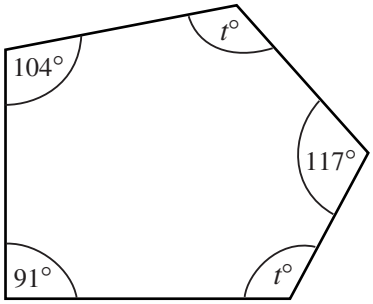
Answer (a) .....h [2]

(b) She started the walk at 20 40. At what time on the next day did she finish the walk?

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

9

NOT TO SCALE



In the pentagon the two angles labelled $t°$ are equal.
Calculate the value of t.

Answer $t =$ ..... [3]

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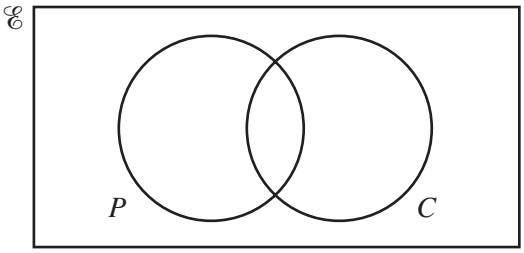
10 Solve the inequality $7 - 5x \geqslant -17$, given that x is a **positive** integer.

Answer $x \in \{$ ..... $\}$ [3]

11

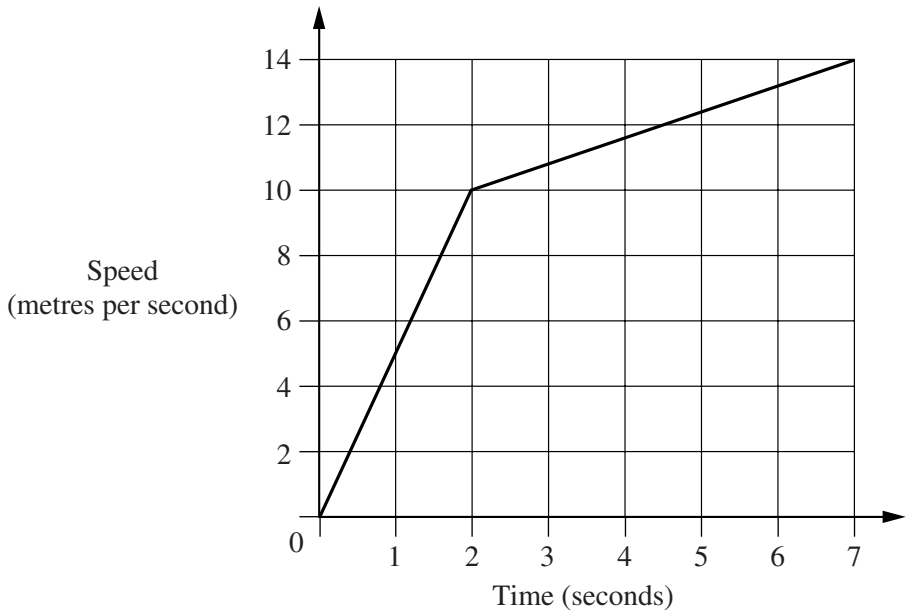


(a) There are 22 students in a class.
15 of these students study Physics (P) and 17 study Chemistry (C).
3 study neither Physics nor Chemistry.
By using the Venn diagram, or otherwise, find the number of students who study both Physics and Chemistry.

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

(b) On the Venn diagram shade the region $P' \cap C$. [1]

12



A car starts from rest. The speed-time graph shows the first 7 seconds of its journey.
Calculate

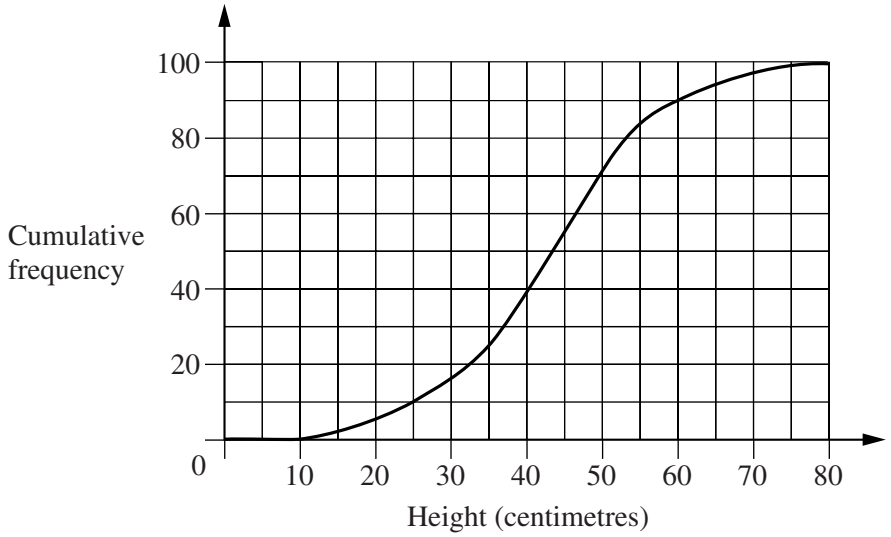
(a) the acceleration between 2 and 7 seconds,

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

(b) the distance travelled by the car during the first 7 seconds.

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

13



The cumulative frequency diagram shows the height of plants measured in an experiment.
From the diagram, estimate

(a) (i) the lower quartile,

Answer (a)(i) .....cm [1]

(ii) the inter-quartile range,

Answer (a) (ii) .....cm [1]

(b) the number of plants with a height **greater than** 25 cm.

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

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14 For a holiday in 1998, Stefan wanted to change 250 Cypriot pounds (£) into Greek Drachma.
He first had to pay a bank charge of $1\frac{1}{2}\%$ of the £250.
He then changed the remaining pounds into Drachma at a rate of £1 = 485 Drachma.
Calculate how many Drachma Stefan received, giving your answer to the nearest 10.

Answer .....Drachma [3]

---

15 **(a)** Factorise $t^2 - 4$.

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

(b) Factorise completely $at^2 - 4a + 2t^2 - 8$.

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

16

NOT TO SCALE

A set of Russian dolls is made so that the volume, V, of each of them varies directly as the cube of its height, h.
The doll with a height of 3 cm has a volume of 6.75 cm^3.

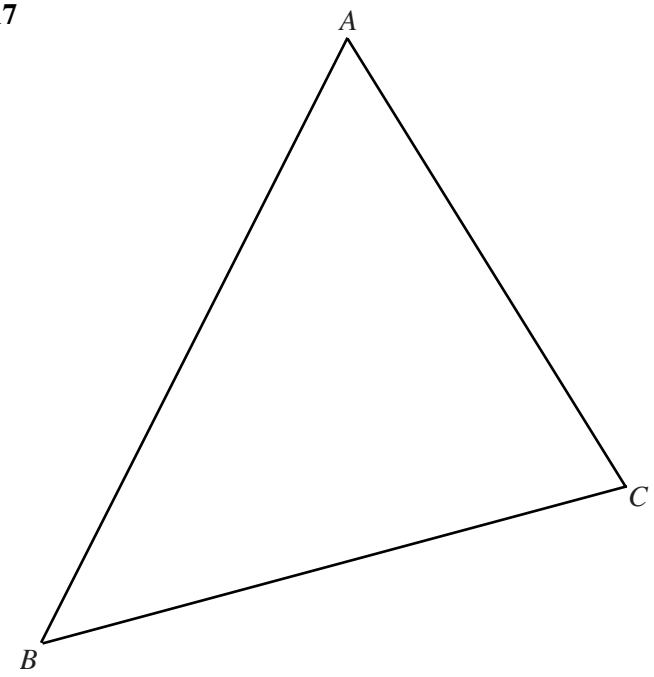
(a) Find an equation for V in terms of h.

Answer (a) $V =$ ..... [2]

(b) Find the volume of a doll with a height of 2.5 cm.

Answer (b) .....cm^3 [1]

17



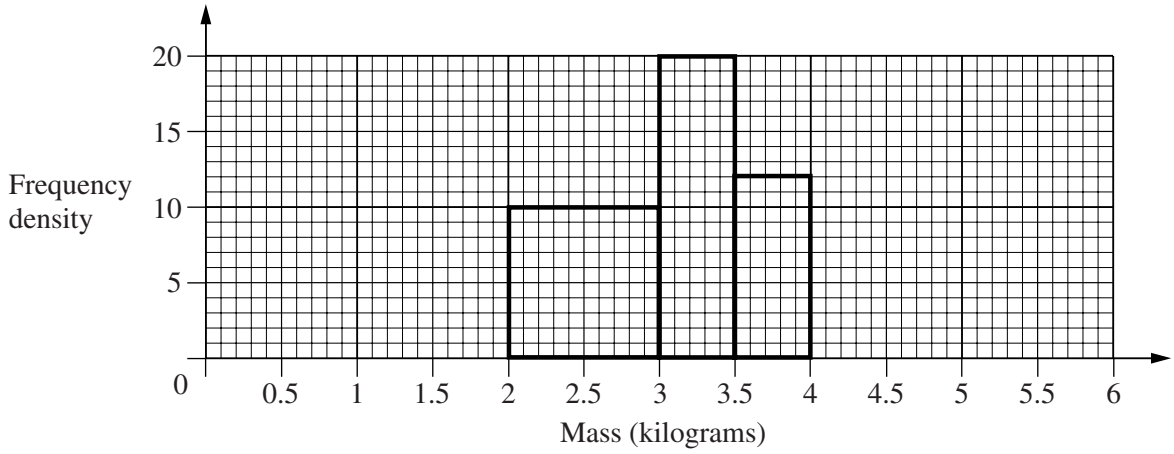
(a) Draw accurately the locus of points inside the triangle

(i) 6 cm from B, [1]

(ii) equidistant from AC and BC. [1]

(b) Shade the region inside the triangle which is more than 6 cm from B **and** nearer to BC than to AC. [1]

18



The mass of each baby born in a hospital during one week is recorded.
The results for babies whose mass is between 2 kg and 4 kg are shown in the histogram.

(a) Complete the frequency table below.

Mass (m) in kilograms	Frequency
$2 < m \leqslant 3$	10
$3 < m \leqslant 3.5$	
$3.5 < m \leqslant 4$	

[2]

(b) 8 babies were born with a mass m kilograms such that $4 < m \leqslant 6$.
Complete the histogram above to show this information. [1]

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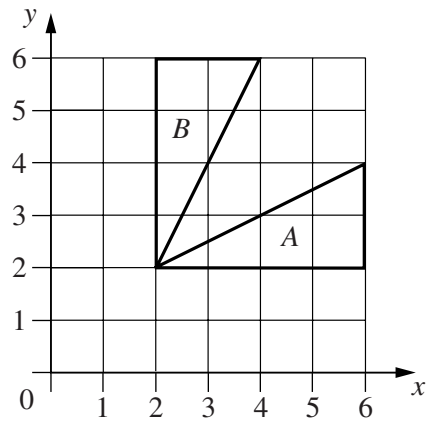


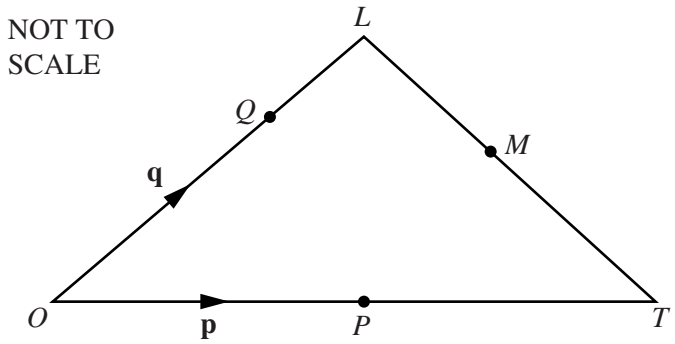
(a) Describe fully the single transformation which maps triangle *A* onto triangle *B*.

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

(b) Find the 2×2 matrix which represents this transformation.

Answer (b) [2]

20



The position vectors $\overrightarrow{OP}$ and $\overrightarrow{OQ}$ are **p** and **q**.
OP is extended to *T* so that *OP* = *PT*.
OQ is extended to *L* so that *OQ* : *QL* = 2:1.

(a) Find, in terms of **p** and/or **q**,

(i) $\overrightarrow{OL}$,

Answer (a)(i) $\overrightarrow{OL}$ = ... [1]

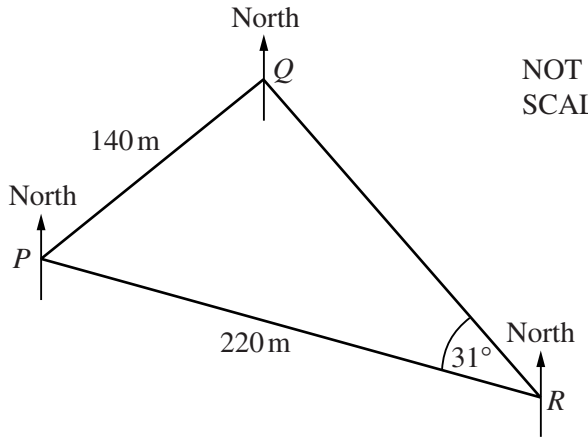
(ii) $\overrightarrow{LT}$.

Answer (a)(ii) $\overrightarrow{LT}$ = ... [1]

(b) *M* is the mid-point of *LT*.
Find $\overrightarrow{OM}$ in terms of **p** and **q**.
Give your answer in its simplest form.

Answer (b) $\overrightarrow{OM}$ = ... [2]

21



Theresa swims from P to Q, then from Q to R and then finally returns from R to P.
$PQ = 140$ m, $RP = 220$ m and angle $PRQ = 31°$.

(a) Angle PQR is **obtuse**.
Calculate its size, to the nearest degree.

Answer (a) ..... [4]

(b) The bearing of Q from P is 060°.
Calculate the bearing of R from Q.

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

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22 f: $x \mapsto 3 - 2x$ and g: $x \mapsto \frac{x+1}{4}$, for all values of x.

(a) Find $f(-\frac{3}{4})$.

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

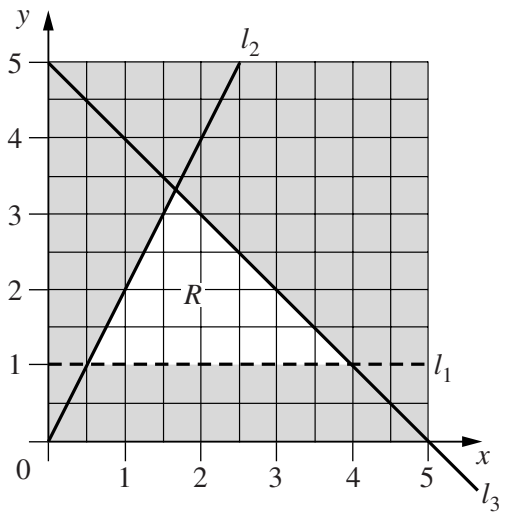
(b) Find the inverse function, $g^{-1}(x)$.

Answer (b) $g^{-1}(x) =$ ..... [2]

(c) Find the composite function, $fg(x)$, giving your answer as a single fraction.

Answer (c) $fg(x) =$ ..... [2]

23



(a) Find the equations of the lines l_1, l_2 and l_3.

Answer (a) l_1: .....

l_2: .....

l_3: ..... [3]

(b) The unshaded region, labelled R, is defined by three inequalities.
Write down these three inequalities.

Answer (b) .....

.....

.....[2]

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