Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

7585955107

MATHEMATICS **0580/22**

Paper 2 (Extended) **February/March 2016**

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Electronic calculator
Tracing paper (optional)
Geometrical instruments

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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

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 70.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **12** printed pages.

DC (LEG/FD) 112489/3

CAMBRIDGE International Examinations

[Turn over

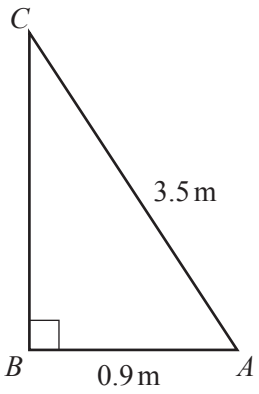
1 Solve $(x - 7)(x + 4) = 0$.

$x =$ ..... or $x =$ .....[1]

2 Factorise $2x - 4xy$.

..... [2]

3



NOT TO SCALE

Calculate angle BAC.

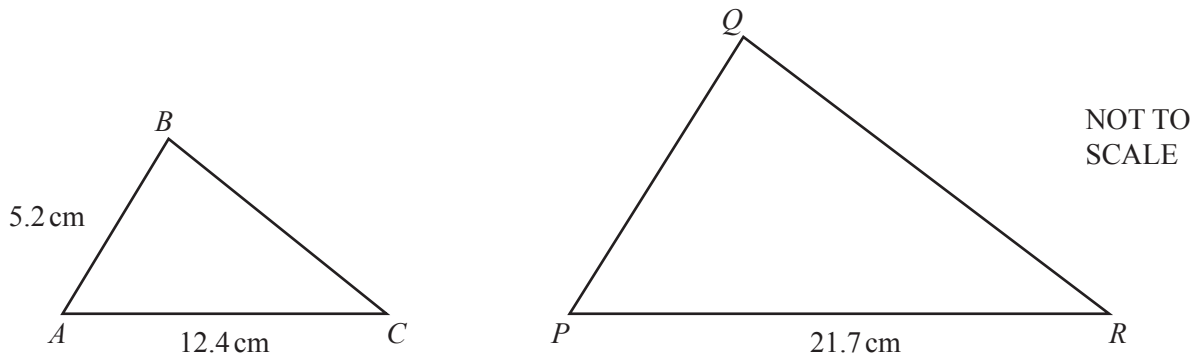
Angle $BAC =$ ..... [2]

4 Solve the inequality.

$$6n + 3 > 8n$$

..... [2]

5 Triangle ABC is similar to triangle PQR.



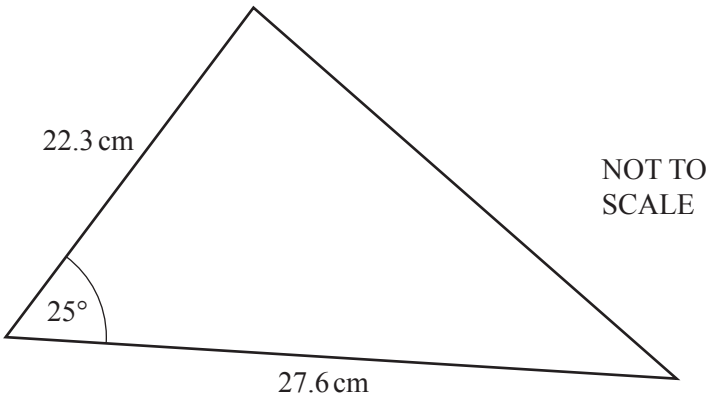
Find PQ.

$PQ =$ ..... cm [2]

6 Write the recurring decimal $0.\dot{4}$ as a fraction.
[$0.\dot{4}$ means 0.444…]

..... [2]

7



Calculate the area of this triangle.

..... cm^2 [2]

8 Find the inverse of the matrix $\begin{pmatrix} 3 & -2 \\ -8 & 7 \end{pmatrix}$.

$\begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$ [2]

9 **Without using your calculator**, work out $1\frac{7}{12} + \frac{13}{20}$.

You must show all your working and give your answer as a mixed number in its simplest form.

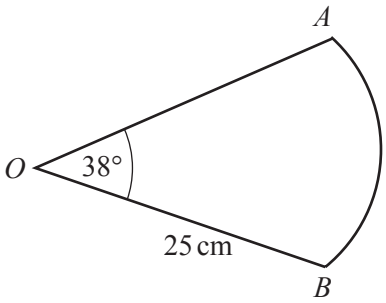
..... [3]

10 The scale on a map is 1 : 20 000.
The area of a lake on the map is 1.6 square centimetres.

Calculate the actual area of the lake.
Give your answer in square metres.

.....m^2 [3]

11



NOT TO SCALE

The diagram shows a sector of a circle, centre O, radius 25 cm.
The sector angle is 38°.

Calculate the length of the arc AB.
Give your answer correct to 4 significant figures.

AB = ... cm [3]

12 A metal pole is 500 cm long, correct to the nearest centimetre.
The pole is cut into rods each of length 5.8 cm, correct to the nearest millimetre.

Calculate the largest number of rods that the pole can be cut into.

..... [3]

13 **(a)** Write 2016 as the product of prime factors.

..... [3]

(b) Write 2016 in standard form.

..... [1]

14 Simplify.

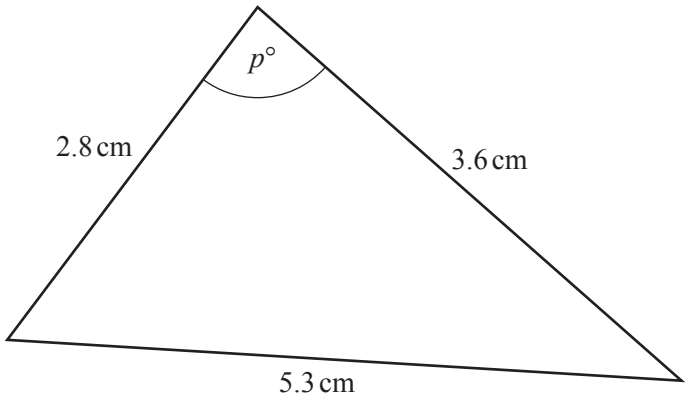
(a) $x^3y^4 \times x^5y^3$

..... [2]

(b) $(3p^2m^5)^3$

..... [2]

15



NOT TO SCALE

Find the value of p.

$p =$ ..... [4]

16 Raj measures the height, h cm, of 70 plants.
The table shows the information.

Height (h cm)	$10 < h \leqslant 20$	$20 < h \leqslant 40$	$40 < h \leqslant 50$	$50 < h \leqslant 60$	$60 < h \leqslant 90$
Frequency	7	15	27	13	8

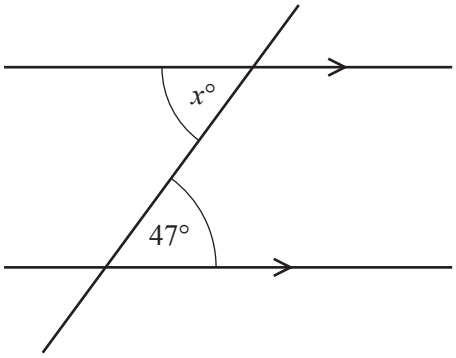
Calculate an estimate of the mean height of the plants.

..... cm [4]

17 Solve the equation $3x^2 - 11x + 4 = 0$.
Show all your working and give your answers correct to 2 decimal places.

x = ... or x = ...[4]

18 (a)

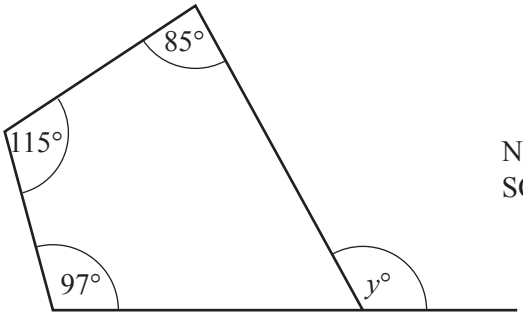


NOT TO SCALE

Find the value of x.

$x =$ ..... [1]

(b)

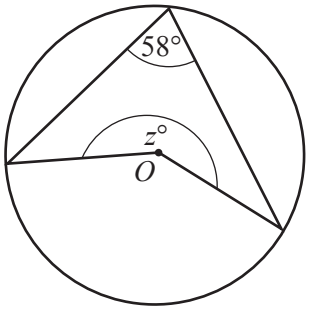


NOT TO SCALE

Find the value of y.

$y =$ ..... [2]

(c)



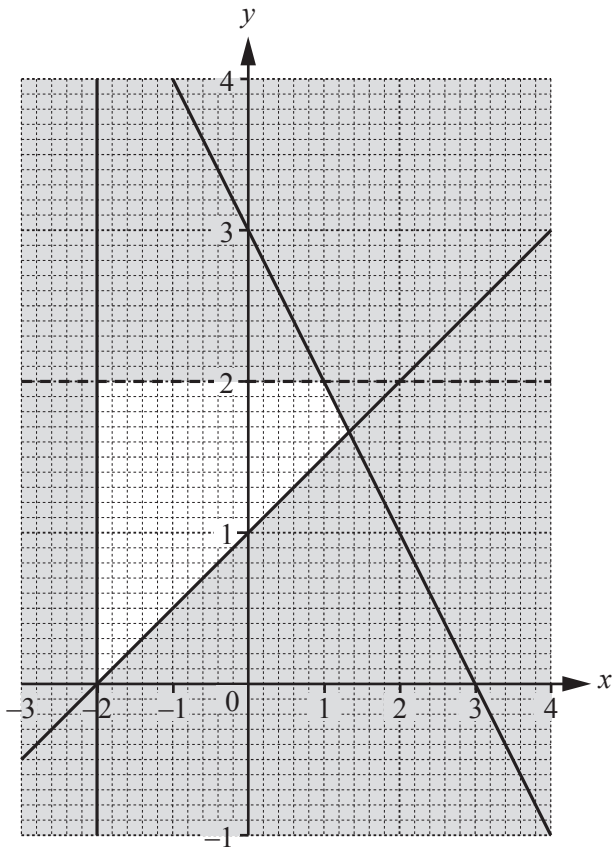
NOT TO SCALE

The diagram shows a circle, centre O.

Find the value of z.

$z =$ ..... [2]

19



Find the four inequalities that define the region that is **not** shaded.

.....

.....

.....

..... [5]

20 The nth term of a sequence is $an^2 + bn$.

(a) Write down an expression, in terms of a and b, for the 3rd term.

..... [1]

(b) The 3rd term of this sequence is 21 and the 6th term is 96.

Find the value of a and the value of b.
You must show all your working.

a = ...

b = ... [4]

Question 21 is printed on the next page.

21 Dan either walks or cycles to school.
The probability that he cycles to school is $\frac{1}{3}$.

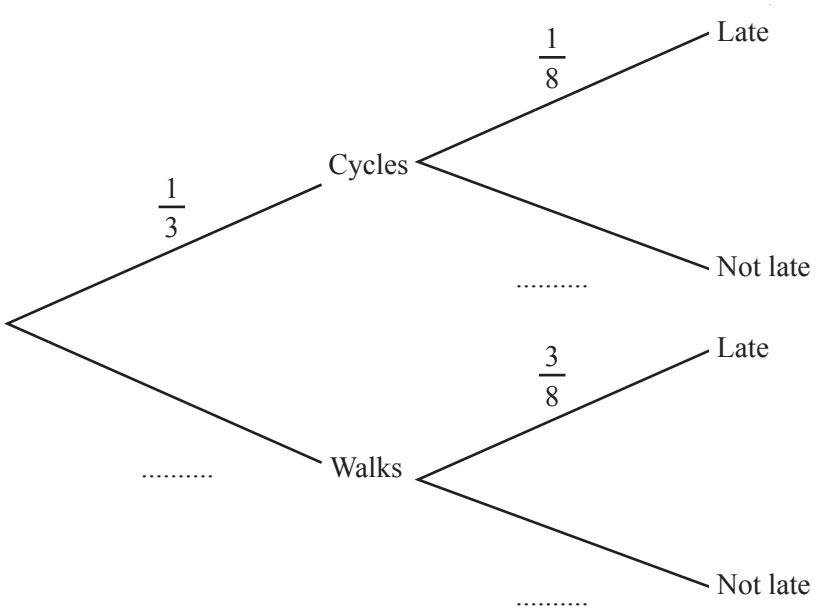
(a) Write down the probability that Dan walks to school.

..... [1]

(b) When Dan cycles to school the probability that he is late is $\frac{1}{8}$.

When Dan walks to school the probability that he is late is $\frac{3}{8}$.

Complete the tree diagram.



[2]

(c) Calculate the probability that

(i) Dan cycles to school and is late,

..... [2]

(ii) Dan is not late.

..... [3]