



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

CANDIDATE  
NAME

--

CENTRE  
NUMBER

--	--	--	--	--

CANDIDATE  
NUMBER

--	--	--	--



**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  $\pi$ , 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.

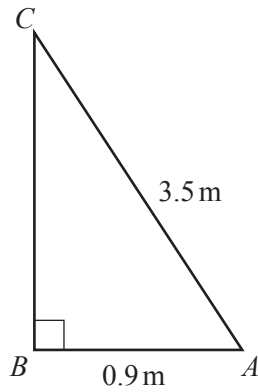
1 Solve  $(x - 7)(x + 4) = 0$ .

$x = \dots\dots\dots$  or  $x = \dots\dots\dots$  [1]

2 Factorise  $2x - 4xy$ .

$\dots\dots\dots$  [2]

3



NOT TO  
SCALE

Calculate angle  $BAC$ .

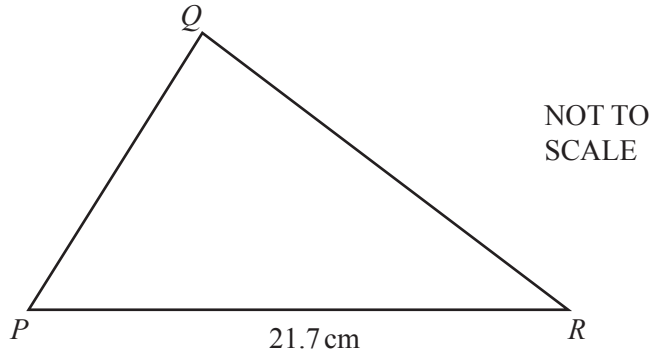
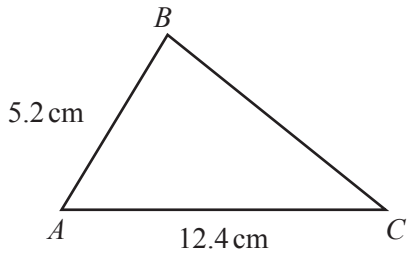
Angle  $BAC = \dots\dots\dots$  [2]

4 Solve the inequality.

$$6n + 3 > 8n$$

$\dots\dots\dots$  [2]

5 Triangle  $ABC$  is similar to triangle  $PQR$ .



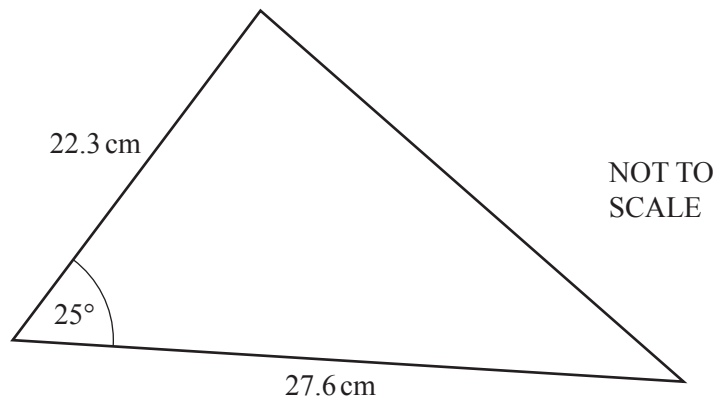
Find  $PQ$ .

$PQ = \dots\dots\dots\text{ cm [2]}$

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

$\dots\dots\dots [2]$

7



Calculate the area of this triangle.

$\dots\dots\dots\text{ cm}^2 [2]$

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

$$\left( \begin{array}{cc} & \\ & \end{array} \right) \quad [2]$$

- 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.

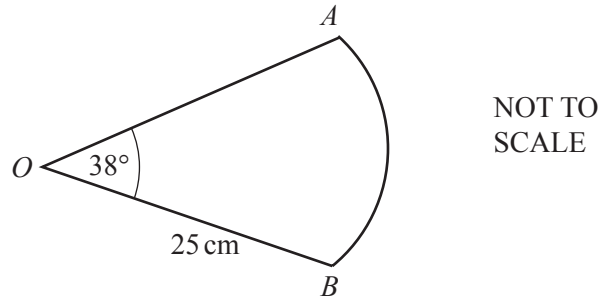
..... [3]

- 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<sup>2</sup> [3]

11



The diagram shows a sector of a circle, centre  $O$ , radius 25 cm.  
The sector angle is  $38^\circ$ .

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

$AB = \dots\dots\dots$  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.

$\dots\dots\dots$  [3]

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

..... [3]

(b) Write 2016 in standard form.

..... [1]

14 Simplify.

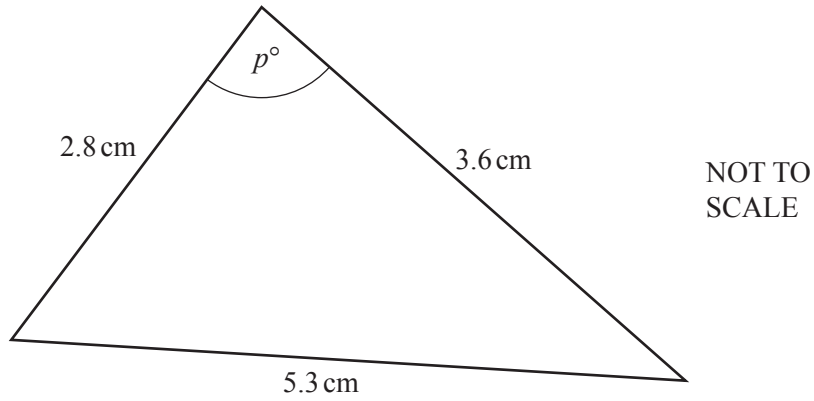
(a)  $x^3y^4 \times x^5y^3$

..... [2]

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

..... [2]

15



Find the value of  $p$ .

$p = \dots\dots\dots$  [4]

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

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

Calculate an estimate of the mean height of the plants.

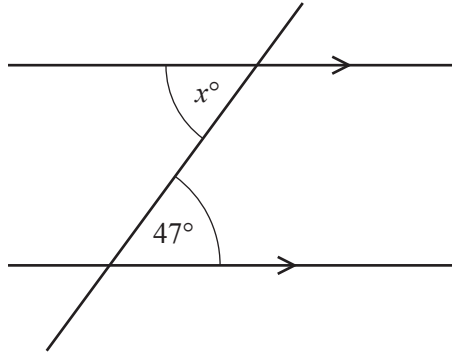
$\dots\dots\dots$  cm [4]

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

$x = \dots\dots\dots$  or  $x = \dots\dots\dots$  [4]



18 (a)

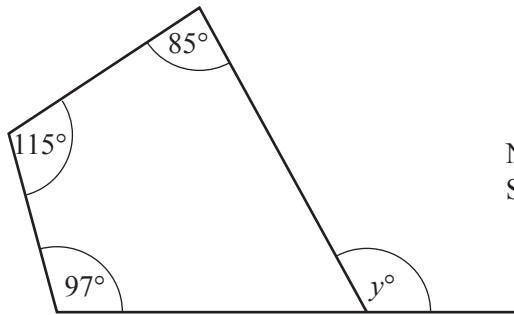


NOT TO SCALE

Find the value of  $x$ .

$x = \dots\dots\dots [1]$

(b)

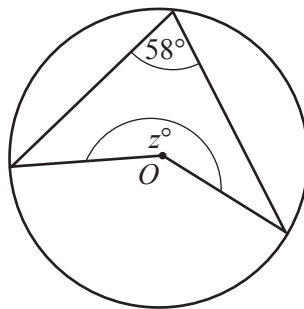


NOT TO SCALE

Find the value of  $y$ .

$y = \dots\dots\dots [2]$

(c)

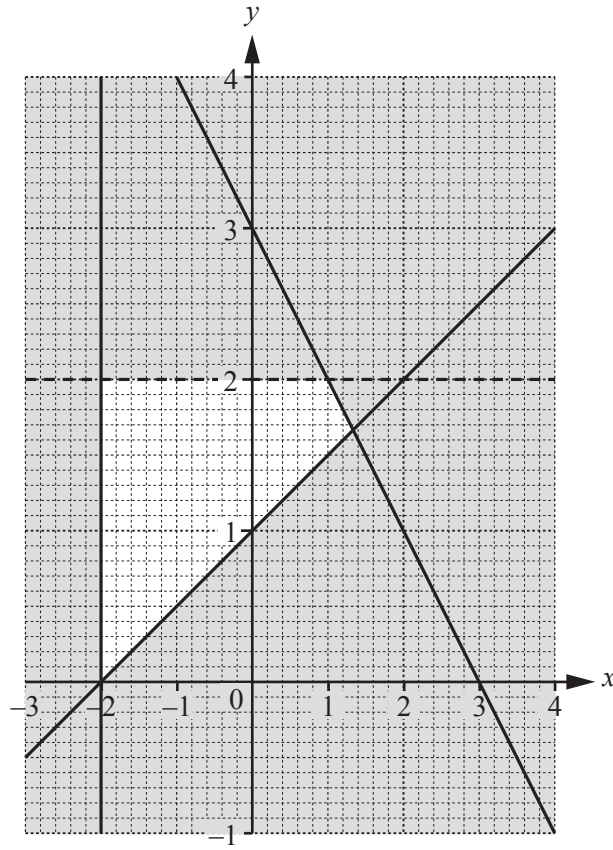


NOT TO SCALE

The diagram shows a circle, centre  $O$ .

Find the value of  $z$ .

$z = \dots\dots\dots [2]$



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

.....  
 .....  
 .....  
 ..... [5]

20 The  $n$ th 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  $\frac{1}{3}$ .

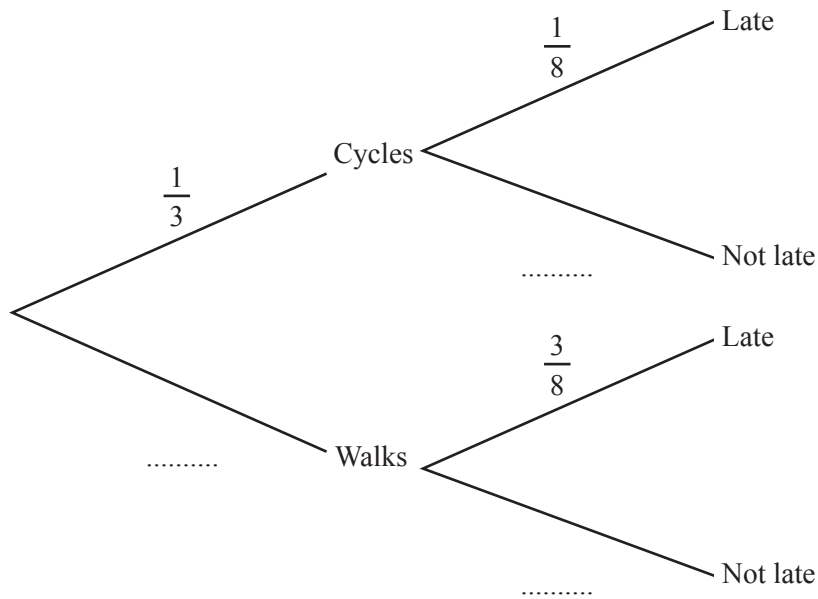
(a) Write down the probability that Dan walks to school.

..... [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]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at [www.cie.org.uk](http://www.cie.org.uk) after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.