Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS **0580/23**

Paper 2 (Extended) **May/June 2018**

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.

© UCLES 2018

CAMBRIDGE International Examinations

1 One day in Chamonix the temperature at noon was 6 °C.
At midnight the temperature was 11 °C lower.

Write down the temperature at midnight.

View solution

..... °C [1]

2 Factorise.

$w + w^3$

View solution

..... [1]

3 Liz takes 65 seconds to run 400 m.

Calculate her average speed.

View solution

..... m/s [1]

4 Complete the list of factors of 36.

View solution

1, 2, ... , 36 [2]

5 Increase \$22 by 15%.

View solution

\$..... [2]

6 **(a)** Write 209 802 correct to the nearest thousand.

View solution

..... [1]

(b) Write 4123 correct to 3 significant figures.

..... [1]

View solution

© UCLES 2018

7 The probability that Kim wins a game is 0.72 .
In one year Kim will play 225 games.

View solution

Work out an estimate of the number of games Kim will win.

..... [2]

8 **(a)** Write 4.82×10^{-3} as an ordinary number.

View solution

..... [1]

(b) Write 52 million in standard form.

View solution

..... [1]

9 Solve.

View solution

$$\frac{1-p}{3} = 4$$

$p =$ ..... [2]

10 Factorise completely.

View solution

$$2a + 4b - ax - 2bx$$

..... [2]

© UCLES 2018

11 $A = (2\pi + y)x^2$

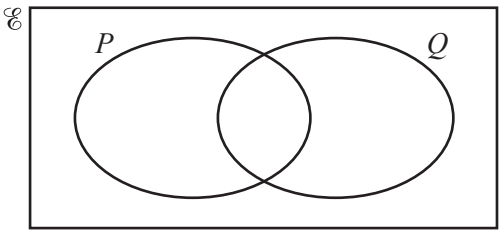
View solution

Rearrange the formula to make x the subject.

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

12

View solution



$n(\mathscr{E}) = 20$, $n(P) = 10$, $n(Q) = 13$ and $n(P \cup Q)' = 5$.

Work out $n(P \cap Q)$.
You may use the Venn diagram to help you.

$n(P \cap Q) =$ ..... [2]

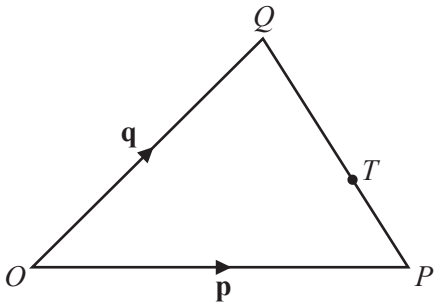
13 Simplify.

$$\frac{3+x}{9-x^2}$$

View solution

..... [2]

14



NOT TO SCALE

View solution

O is the origin, $\overrightarrow{OP} = \mathbf{p}$ and $\overrightarrow{OQ} = \mathbf{q}$.
$QT : TP = 2 : 1$

Find the position vector of T.
Give your answer in terms of **p** and **q**, in its simplest form.

..... [2]

15 **Without using a calculator**, work out $\frac{2}{3} \div 1\frac{1}{5}$.

View solution

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

..... [3]

16 **(a)** The length of the side of a square is 12 cm, correct to the nearest centimetre.

View solution

Calculate the upper bound for the perimeter of the square.

..... cm [2]

(b) Jo measures the length of a rope and records her measurement correct to the nearest ten centimetres.
The upper bound for her measurement is 12.35 m.

View solution

Write down the measurement she records.

..... m [1]

© UCLES 2018

17 **(a)** Find the value of $\left(\frac{1}{81}\right)^{-\frac{3}{4}}$.

View solution

..... [1]

(b) Simplify. $\sqrt[3]{27t^{27}}$

View solution

..... [2]

18 Expand the brackets and simplify.

$$(2p+3)(3p-2)$$

View solution

..... [3]

19 y is directly proportional to $(x-1)^2$.
When $x = 3$, $y = 24$.

View solution

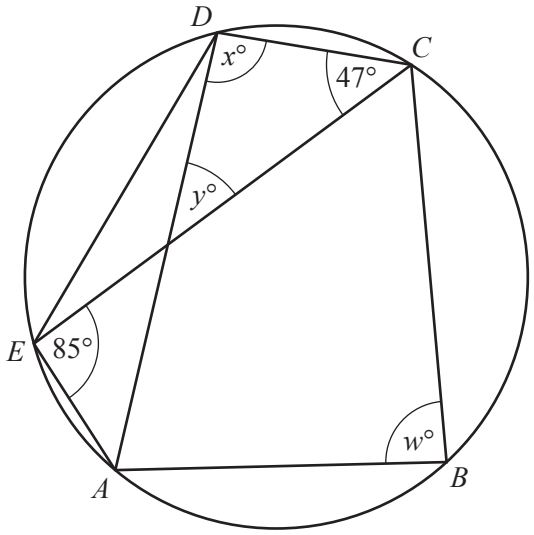
Find y when $x = 6$.

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

© UCLES 2018

20

View solution



NOT TO SCALE

The points A, B, C, D and E lie on the circumference of the circle.
Angle $DCE = 47°$ and angle $CEA = 85°$.

Find the values of w, x and y.

$w =$ .....

$x =$ .....

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

21 Write as a single fraction in its simplest form.

View solution

$$\frac{1}{y-1} - \frac{1}{y}$$

..... [3]

22 Find an expression for the nth term of each sequence.

(a) 11, 7, 3, −1, …

View solution

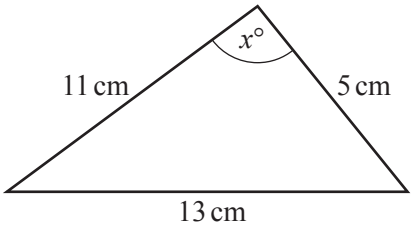
..... [2]

(b) 3, 6, 12, 24, …

View solution

..... [2]

23



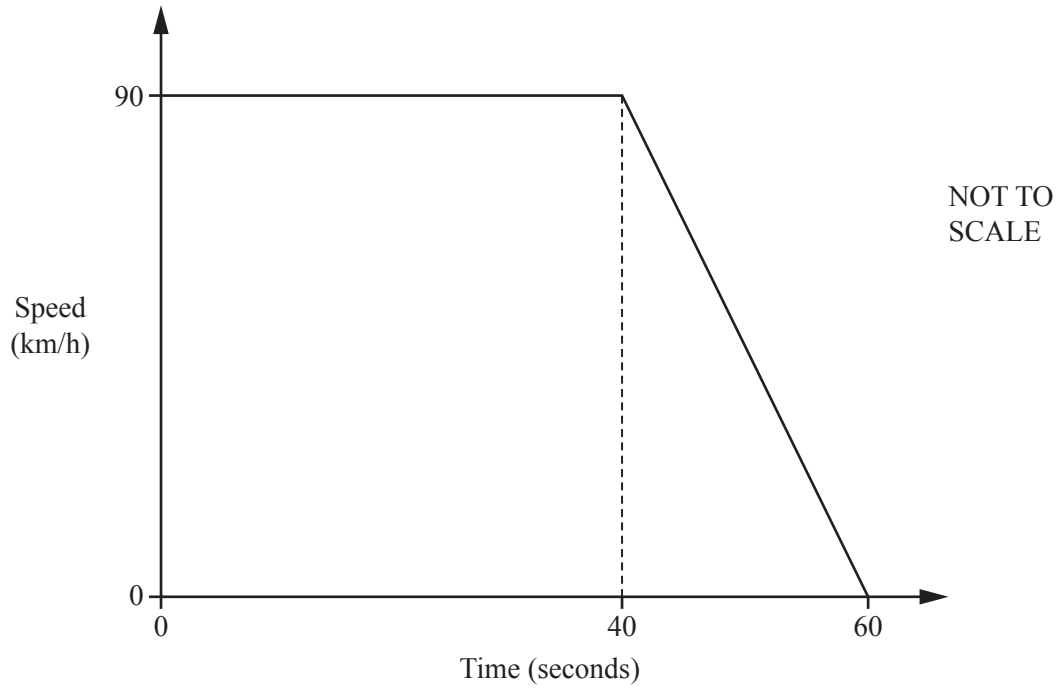
NOT TO SCALE

View solution

Calculate the value of x.

$x =$ ..... [4]

24



The diagram shows the speed–time graph for 60 seconds of a car journey.

(a) Change 90 km/h to m/s.

View solution

..... m/s [2]

(b) Find the deceleration of the car in m/s^2.

View solution

..... m/s^2 [1]

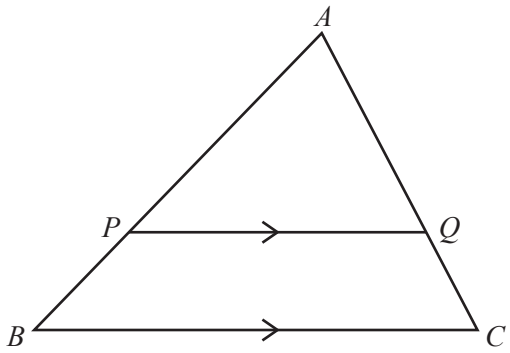
(c) Find the distance travelled, in metres, in the 60 seconds.

View solution

..... m [2]

25 (a)

View solution



NOT TO SCALE

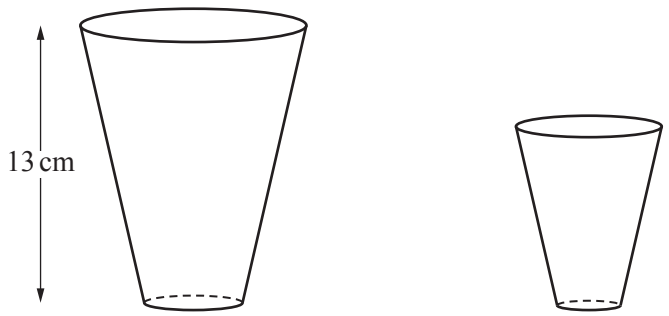
In the diagram, PQ is parallel to BC.
APB and AQC are straight lines.
$PQ = 8$ cm, $BC = 10$ cm and $AB = 9$ cm.

Calculate PB.

$PB =$ ..... cm [2]

(b)

View solution



NOT TO SCALE

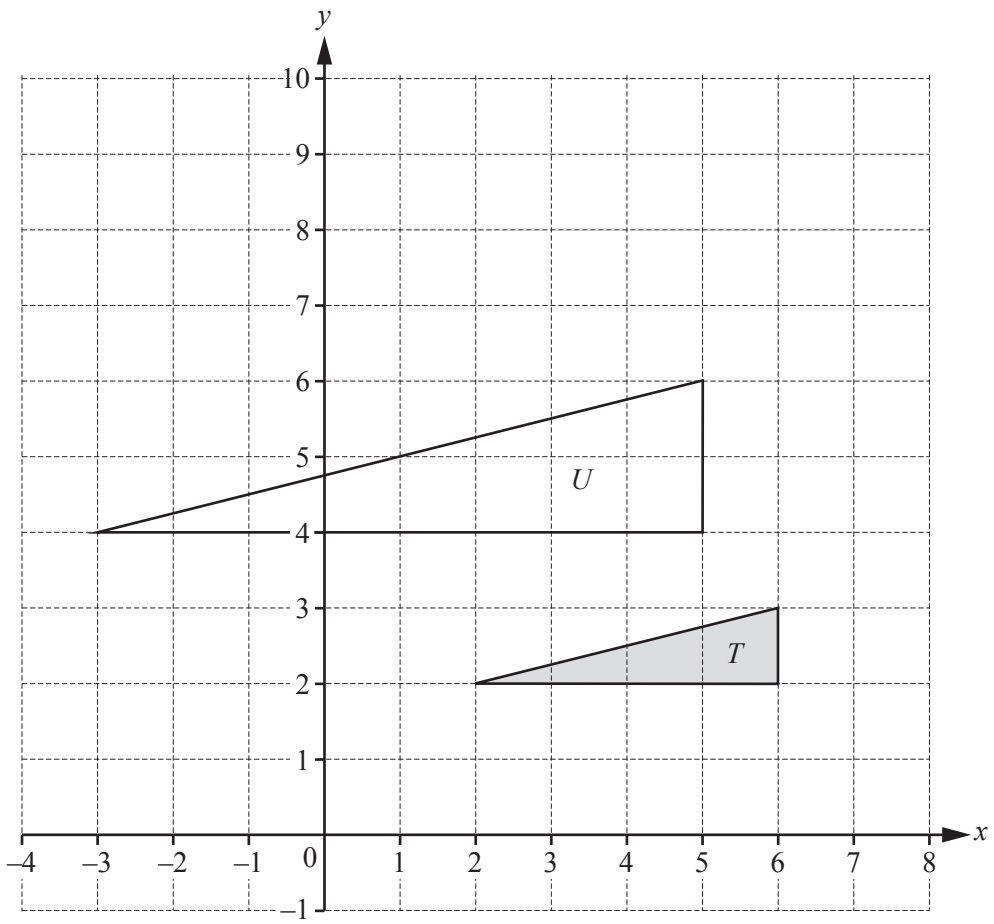
The diagram shows two glasses which are mathematically similar.
The larger glass has a capacity of 0.5 litres and the smaller glass has a capacity of 0.25 litres.
The height of the larger glass is 13 cm.

Calculate the height of the smaller glass.

..... cm [3]

© UCLES 2018

26



(a) Describe fully the **single** transformation that maps triangle *T* onto triangle *U*.

View solution

.....

..... [3]

(b) On the grid, draw the image of triangle *T* after a rotation through 90° clockwise about the point (7, 3). [3]

View solution

© UCLES 2018

BLANK PAGE

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 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.