Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS **0580/21**

Paper 2 (Extended) **October/November 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.

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CAMBRIDGE International Examinations

1 Write down the temperature which is 5 °C below –2 °C.

..... °C [1]

View solution

2 Write 0.040 190 7 correct to

View solution

(a) 3 significant figures,

.....[1]

(b) 3 decimal places.

View solution

.....[1]

3 The price of a toy is 12 euros (€) in Germany and 14 Swiss francs in Switzerland.
1 Swiss franc = €0.905

View solution

Calculate the difference between these two prices.
Give your answer in euros.

€ .....[2]

4 Work out $\frac{2}{3} - \frac{1}{4}$, giving your answer as a fraction in its lowest terms.

View solution

Do not use a calculator and show all the steps of your working.

.....[2]

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5 **(a)** Write 5^{-3} as a fraction.

View solution

..... [1]

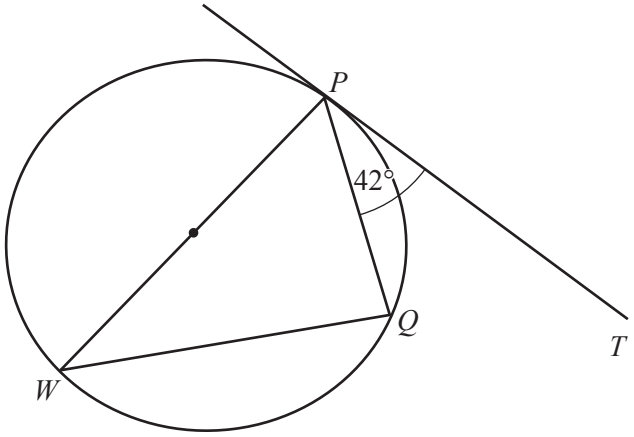
(b) Write 0.004 56 in standard form.

View solution

..... [1]

6

View solution



NOT TO SCALE

In the diagram, PT is a tangent to the circle at P.
PW is a diameter and angle $TPQ = 42°$.

Find angle PWQ.

Angle PWQ = ... [2]

7 Simplify. $\dfrac{x^3y + 2xy^3}{x^2y^2}$

View solution

..... [2]

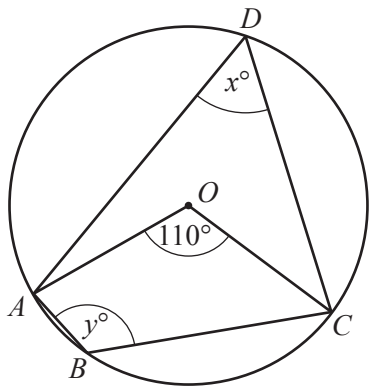
8 Write as a single fraction.

$$1 - \frac{2}{p} - \frac{3}{t}$$

View solution

..... [2]

9



NOT TO SCALE

View solution

A, B, C and D lie on the circle, centre O.

Find the value of x and the value of y.

$x =$ .....

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

10 Simplify.

$$(36x^{16})^{\frac{1}{2}}$$

View solution

..... [2]

11 Solve the simultaneous equations.
You must show all your working.

View solution

$$2x + 3y = 13$$
$$x + 2y = 9$$

$x =$ .....

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

12 **(a)** Write \$0.70 as a fraction of \$5.60, giving your answer in its lowest terms.

View solution

..... [1]

(b) Write the recurring decimal $0.\dot{1}\dot{8}$ as a fraction in its lowest terms.
[$0.\dot{1}\dot{8}$ means 0.181818…]

View solution

..... [2]

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13 Factorise completely.

(a) $4p^2 - 9$

View solution

..... [1]

(b) $2ax - 4bx - ay + 2by$

View solution

..... [2]

14 y is directly proportional to the square root of $(x + 2)$.
When $x = 7$, $y = 2$.

View solution

Find y when $x = 98$.

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

15 Work out.

(a) $2\begin{pmatrix} 3 \\ 5 \end{pmatrix} - \begin{pmatrix} 1 \\ 2 \end{pmatrix}$

View solution

..... [1]

(b) $\begin{pmatrix} 1 & 2 \end{pmatrix}\begin{pmatrix} 2 \\ 3 \end{pmatrix}$

View solution

..... [2]

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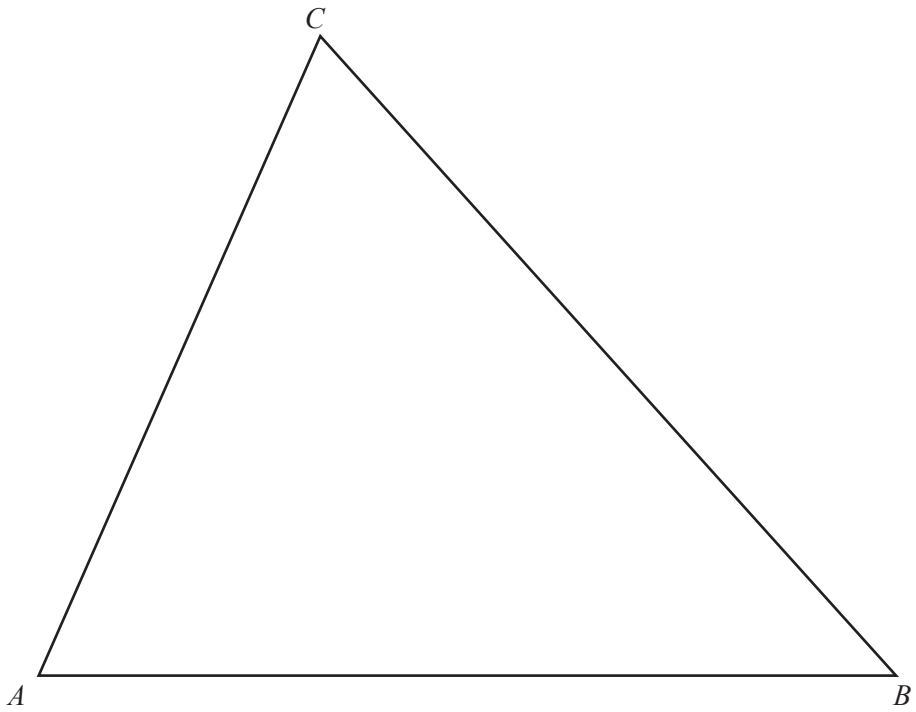
16 Two cups are mathematically similar.
The larger cup has capacity 0.5 litres and height 8 cm.
The smaller cup has capacity 0.25 litres.

View solution

Find the height of the smaller cup.

..... cm [3]

17



View solution

(a) Construct the locus of points, inside the triangle, that are 5 cm from B. [1]

View solution

(b) Construct the locus of points, inside the triangle, that are equidistant from AB and BC. [2]

(c) Shade the region, inside the triangle, containing points that are

- more than 5 cm from B

and

- nearer to AB than to BC. [1]

View solution

18 $y = p^2 + qr$

(a) Find y when $p = -5$, $q = 3$ and $r = -7$.

View solution

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

(b) Write p in terms of q, r and y.

View solution

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

19 Find the nth term of each sequence.

(a) 7, 13, 19, 25, 31, …

View solution

..... [2]

(b) 9, 16, 25, 36, 49, …

View solution

..... [2]

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20 A train travels for m minutes at a speed of x metres per second.

(a) Find the distance travelled, in **kilometres**, in terms of m and x.
Give your answer in its simplest form.

View solution

..... km [2]

(b) When $m = 5$, the train travels 10.5 km.

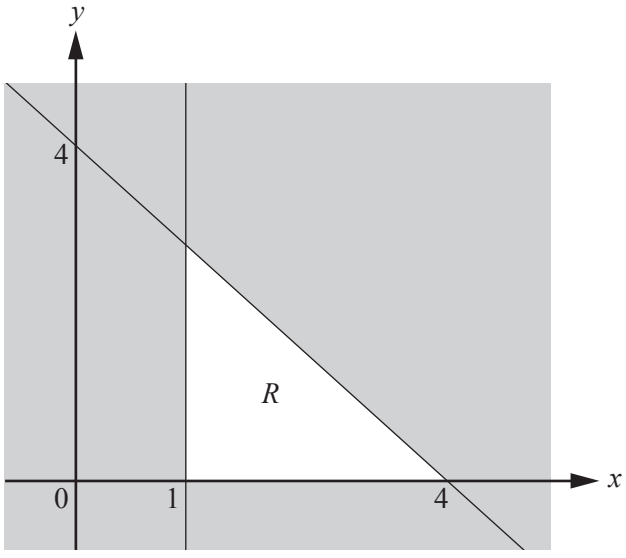
Find the value of x.

View solution

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

21

View solution



NOT TO SCALE

Write down the three inequalities that define the unshaded region, R.

.....

.....

..... [4]

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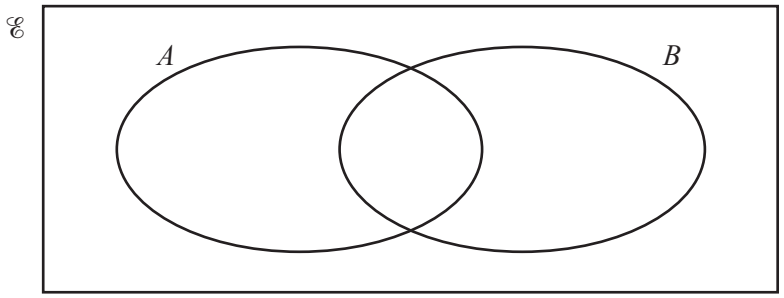
22 **(a)** $n(\mathscr{E}) = 10,\ n(A) = 7,\ n(B) = 6,\ n(A \cup B)' = 1.$

View solution



(i) Complete the Venn diagram by writing the number of elements in each subset. [2]

(ii) An element of $\mathscr{E}$ is chosen at random.

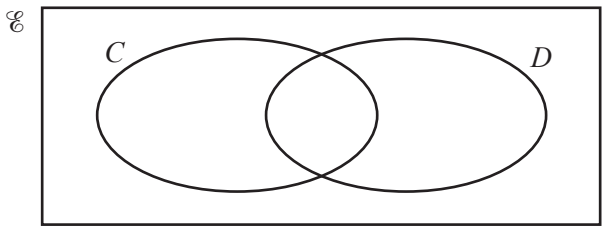
View solution

Find the probability that this element is an element of $A' \cap B$.

..... [1]

(b) On the Venn diagram below, shade the region $C' \cap D'$.

View solution



[1]

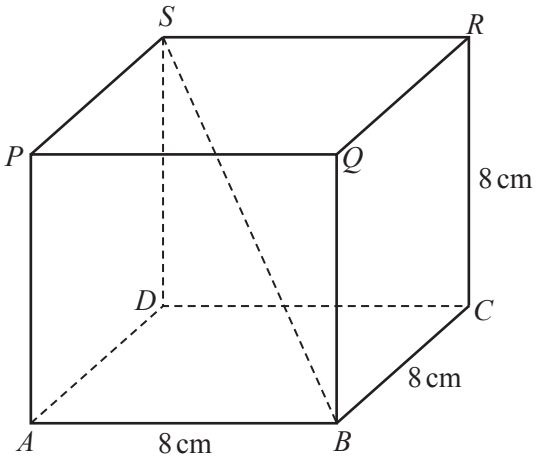
23 Solve the equation $2x^2 + 3x - 3 = 0$.
Show all your working and give your answers correct to 2 decimal places.

View solution

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

Question 24 is printed on the next page.

24



NOT TO SCALE

The diagram shows a cube of side length 8 cm.

(a) Calculate the length of the diagonal *BS*.

View solution

BS = ... cm [3]

(b) Calculate angle *SBD*.

View solution

Angle *SBD* = ... [2]

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