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 2014**

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.

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CAMBRIDGE International Examinations

1 Use your calculator to find the value of 1.35^7.

Give your answer correct to 5 significant figures.

View solution

Answer ..... [2]

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2 Write the following in order of size, smallest first.

View solution

π 3.14 $\frac{22}{7}$ 3.142 3

Answer ..... < ..... < ..... < ..... < ..... [2]
smallest

3

Z E B R A

Write down the letters in the word above that have

(a) exactly one line of symmetry,

View solution

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

(b) rotational symmetry of order 2.

View solution

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

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4 Cheryl recorded the midday temperatures in Seoul for one week in January.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temperature (°C)	–4	–5	–3	–11	–8	–3	–1

(a) Write down the mode.

View solution

Answer(a) ..... °C [1]

(b) On how many days was the temperature lower than the mode?

View solution

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

---

5 Without using a calculator, work out $\frac{1}{4} + \frac{1}{6}$.

View solution

Write down all the steps in your working and give your answer as a fraction in its simplest form.

Answer ..... [2]

---

6 Write 15.0782 correct to

(a) one decimal place,

View solution

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

(b) the nearest 10.

View solution

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

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7 The population of Dubai at the end of 2012 was 2.1 million.
This was predicted to increase at a rate of 6% each year.

View solution

Calculate the predicted population of Dubai at the end of 2015.

Answer ..... million [3]

---

8 On a ship, the price of a gift is 24 euros (€) or $30.

View solution

What is the difference in the price on a day when the exchange rate is €1 = $1.2378?
Give your answer in dollars, correct to the nearest cent.

Answer $..... [3]

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9 **(a)** Write 2.8×10^2 as an ordinary number.

View solution

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

(b) Work out $2.5 \times 10^8 \times 2 \times 10^{-2}$.
Give your answer in standard form.

View solution

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

---

10 Solve the equation.

$$\frac{x+5}{x} = \frac{7}{3}$$

View solution

Answer $x =$ ..... [3]

---

11 **(a)** Simplify $x^8 \div x^2$.

View solution

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

(b) Simplify $\left(\frac{x^6}{27}\right)^{\frac{1}{3}}$.

View solution

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

---

12 Solve the simultaneous equations.

$$0.4x - 5y = 27$$
$$2x + 0.2y = 9$$

View solution

Answer x = ...

y = ... [3]

---

13 y varies directly with $\sqrt{x+5}$.
$y = 4$ when $x = -1$.

Find y when $x = 11$.

View solution

Answer y = ... [3]

---

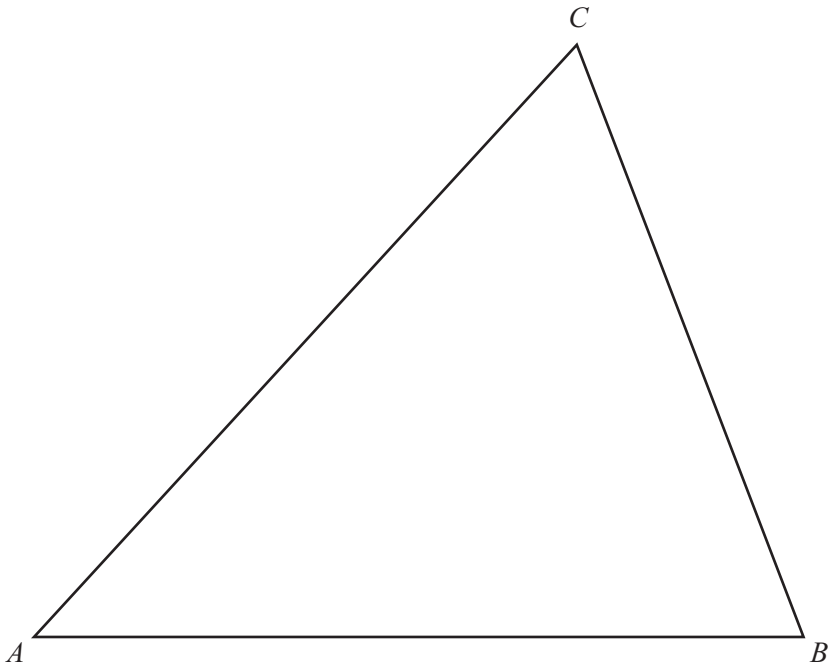
14 $\mathbf{A} = \begin{pmatrix} 2 & 8 \\ 1 & 4 \end{pmatrix}$

View solution

Work out $\mathbf{A}^2 - 4\mathbf{A}$.

Answer $\begin{pmatrix} \quad & \quad \\ \quad & \quad \end{pmatrix}$ [3]

15



View solution

(a) **Using compasses and straight edge only**, construct

(i) the perpendicular bisector of AC, [2]

(ii) the bisector of angle ACB. [2]

View solution

(b) Shade the region inside the triangle which is

- nearer to A than to C

and

- nearer to AC than to BC. [1]

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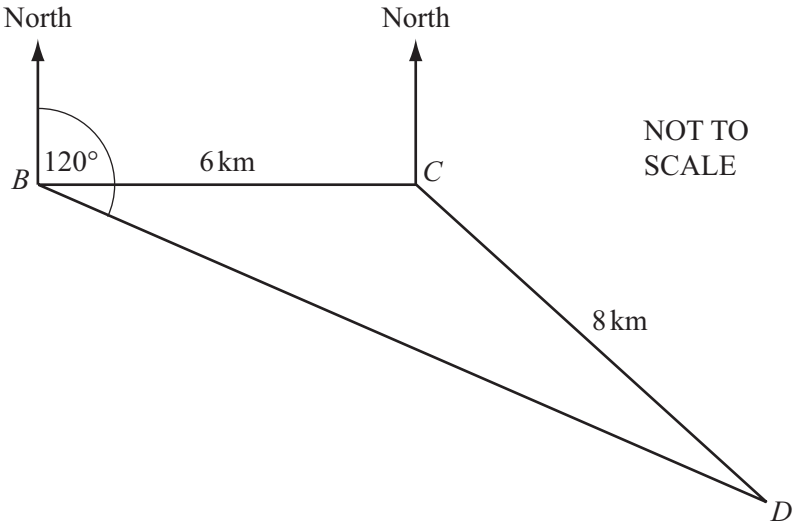
16 A helicopter flies from its base B to deliver supplies to two oil rigs at C and D.
C is 6 km due east of B and the distance from C to D is 8 km.
D is on a bearing of 120° from B.

View solution

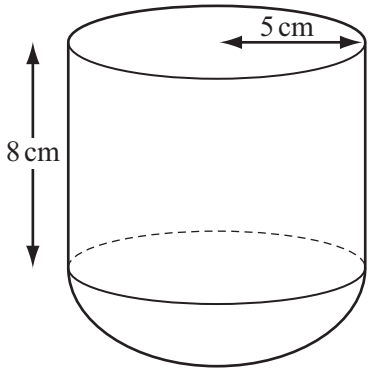


Find the bearing of D from C.

Answer ..... [5]

17 The diagram shows a child's toy.

View solution



NOT TO SCALE

The shape of the toy is a cylinder of radius 5 cm and height 8 cm on top of a hemisphere of radius 5 cm.

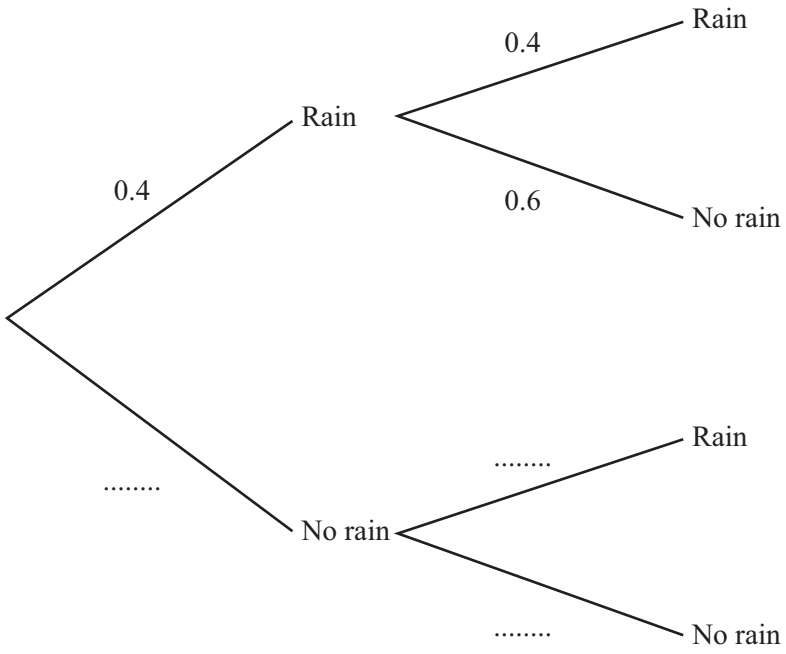
Calculate the volume of the toy.
[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

Answer ..... cm^3 [5]

18 If it rains today the probability that it will rain tomorrow is 0.4 .
If it does not rain today the probability that it will rain tomorrow is 0.2 .
On Sunday it rained.

View solution

(a) Complete the tree diagram for Monday and Tuesday.



[2]

(b) Find the probability that it rains on at least one of the two days shown in the tree diagram.

View solution

Answer(b) ..... [3]

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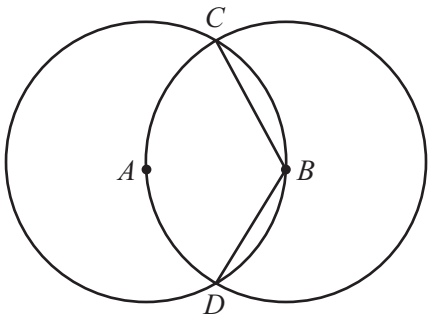
19



NOT TO SCALE

Two circles, centres A and B, are each of radius 8 cm and intersect at C and D. Each circle passes through the centre of the other circle.

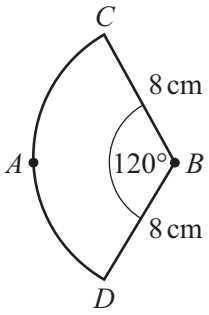
(a) Explain why angle CBD is 120°.

View solution

Answer(a)

[1]

(b) For the circle, centre B, find the area of the sector BCD.

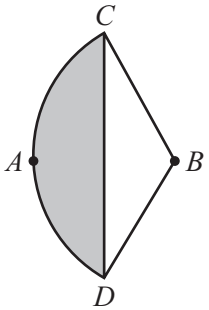


NOT TO SCALE

View solution

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

(c) **(i)** Find the area of the shaded segment CAD.



NOT TO SCALE

View solution

Answer(c)(i) ..... cm^2 [3]

(ii) Find the area of overlap of the two circles.

View solution

Answer(c)(ii) ..... cm^2 [1]

Question 20 is printed on the next page.

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20 $f(x) = 3x - 2$ $\quad g(x) = \dfrac{2}{x+1}$, $\quad x \neq -1$

(a) Find $gf(2)$.

View solution

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

(b) Solve $g(x) = 10$.

View solution

Answer(b) $x =$ ..... [2]

(c) Simplify.

$$f(2x) - f(x + 2)$$

View solution

Answer(c) ..... [3]

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