Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

MATHEMATICS **0580/22**

Paper 2 (Extended) **October/November 2024**

1 hour 30 minutes

You must answer on the question paper.

You will need: Geometrical instruments

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.

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1 These are the first eight terms of a sequence.

View solution

c $\quad -3 \quad -9 \quad -15 \quad -21 \quad -27 \quad -33 \quad k$

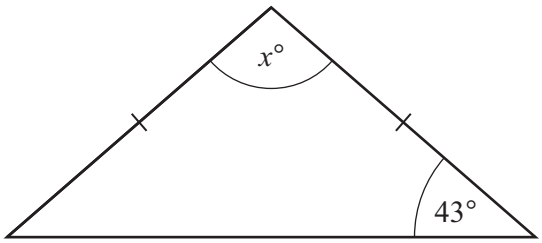
Find the value of c and the value of k.

$c =$ .....

$k =$ ..... [2]

2 The diagram shows an isosceles triangle.

View solution



NOT TO SCALE

Find the value of x.

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

3

View solution

0.25	3.142	$\sqrt{3}$	-3	24	-0.4	1.2	$-\frac{1}{4}$

Complete each statement with a number from the list.

..... is a natural number.

..... is an irrational number.

..... is the reciprocal of 4.

[3]

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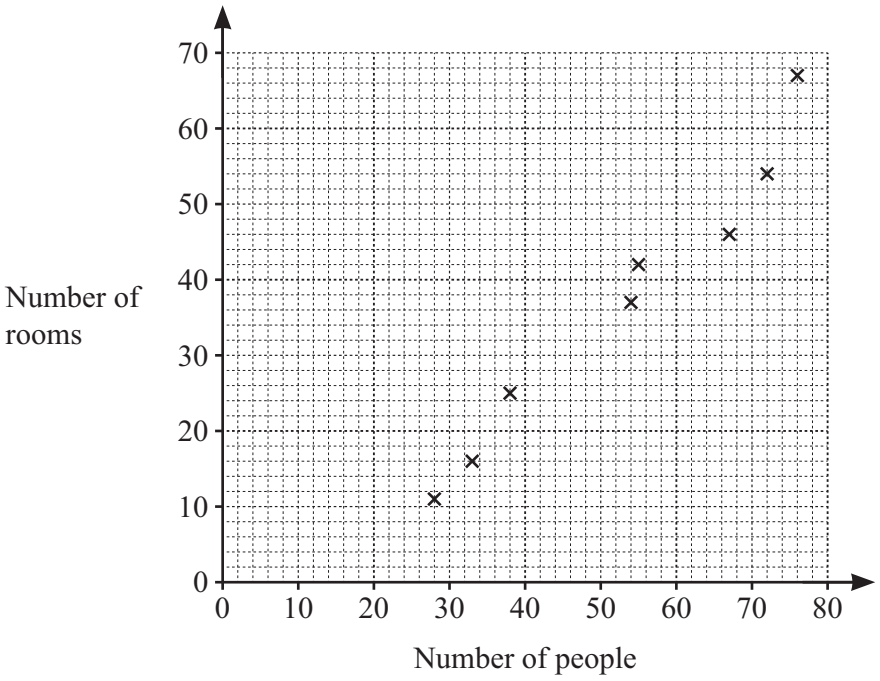
4 The scatter diagram shows the number of rooms and the number of people in each of eight buildings.



(a) One of the buildings has 67 rooms.

View solution

Write down the number of people in this building.

..... [1]

(b) In another building there are 42 people and 33 rooms.

View solution

On the scatter diagram, plot this point. [1]

(c) **(i)** On the scatter diagram, draw a line of best fit. [1]

(ii) There are 45 people in a different building.

View solution

Find an estimate for the number of rooms in this building.

..... [1]

(d) What type of correlation is shown in the scatter diagram?

View solution

..... [1]

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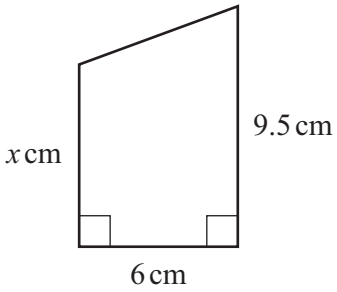
5 Convert $7.51\,m^2$ into cm^2.

View solution

..... cm^2 [1]

View solution

6 The diagram shows a trapezium.



NOT TO SCALE

The area of the trapezium is $42\,cm^2$.

Calculate the value of x.

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

7 **Without using a calculator**, work out $\frac{2}{7} \div \frac{6}{11}$.

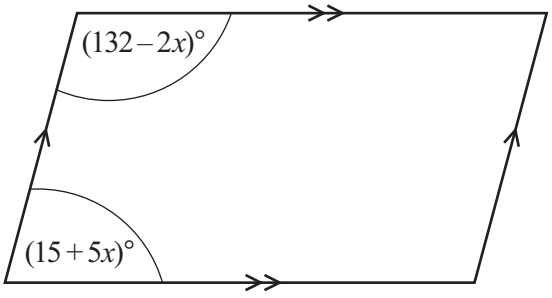
You must show all your working and give your answer as a fraction in its simplest form.

View solution

..... [2]

8 The diagram shows a parallelogram.

View solution



NOT TO SCALE

Work out the size of the smallest interior angle of the parallelogram.

..... [4]

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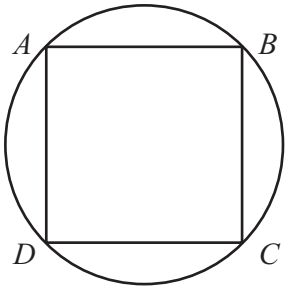
9



NOT TO SCALE

View solution

Points A, B, C and D lie on a circle.
$ABCD$ is a square with area $72\,\text{cm}^2$.

Calculate the area of the circle.
Give your answer as a multiple of π.

..... cm^2 [3]

10 Calculate $\sqrt[3]{1+10.9\times0.4^2}$.

View solution

..... [1]

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11 Factorise fully.

(a) $24x^2 - 9xy$

View solution

..... [2]

(b) $63x^2 - 28y^2$

View solution

..... [3]

12 y is directly proportional to the square root of $x + 1$.
$y = 10.5$ when $x = 8$.

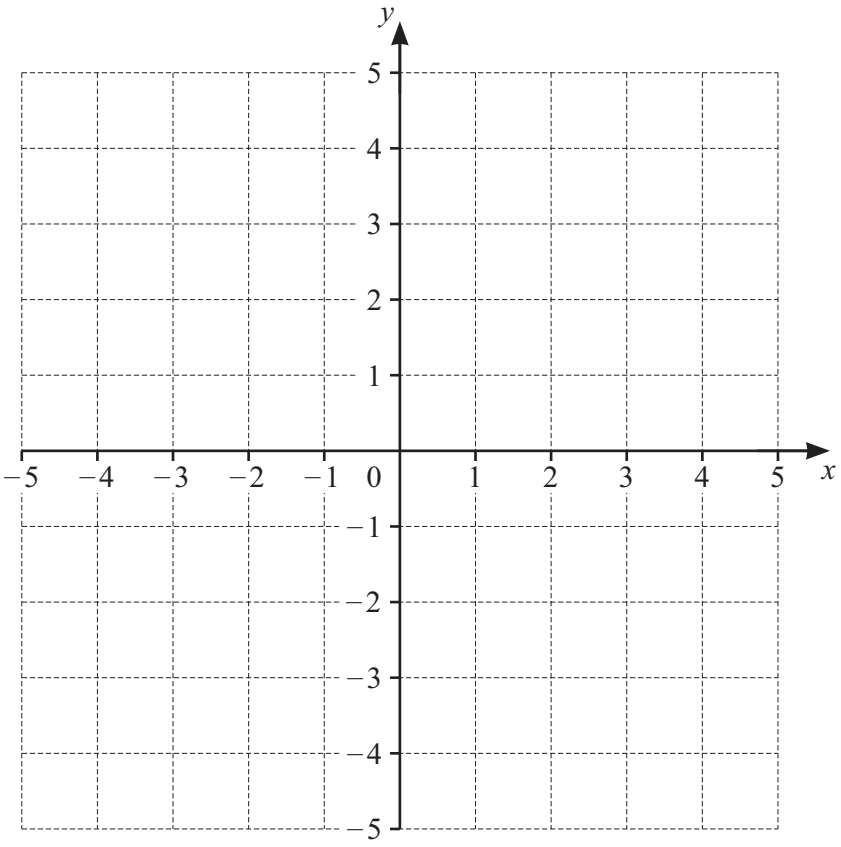
View solution

Find y when $x = 1.56$.

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

13

View solution



The region R satisfies these inequalities.

$$-3 < y \leqslant 2 \qquad\qquad y \leqslant x - 1$$

By drawing suitable straight lines and shading **unwanted** regions, find and label the region R.

[4]

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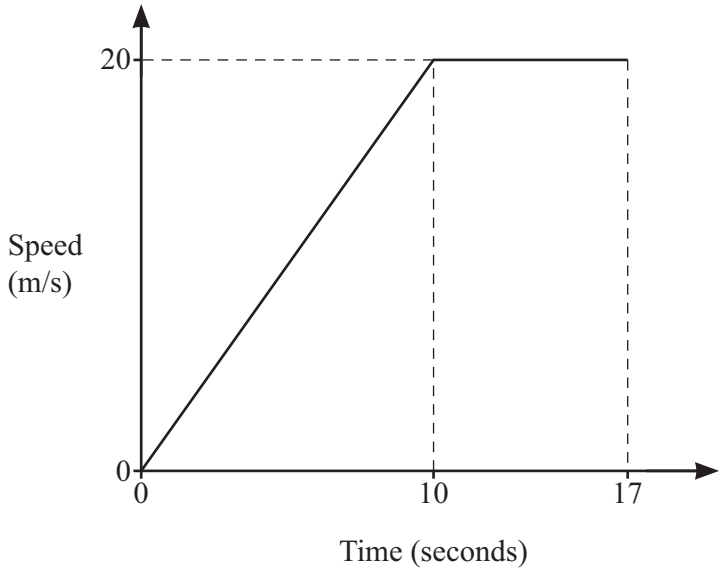
14



NOT TO
SCALE

The diagram shows the speed–time graph for 17 seconds of a car journey.

(a) Find the acceleration of the car during the first 10 seconds.

View solution

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

(b) Calculate the total distance travelled by the car during the 17 seconds.

View solution

..... m [3]

15 At the start of an experiment there are 40 000 bacteria.
The number of bacteria increases at a rate of 15% per hour.

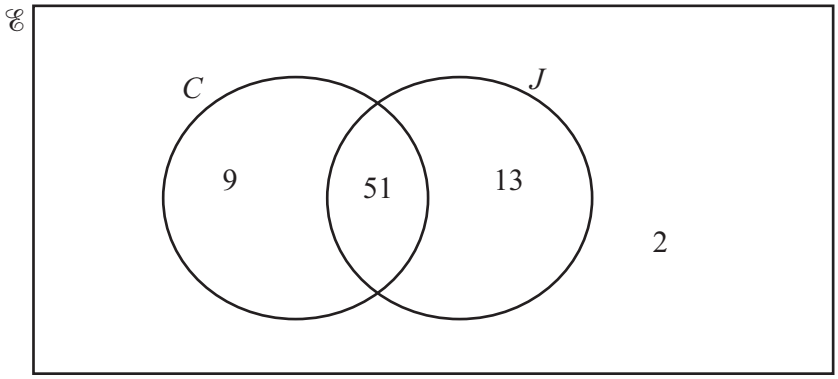
View solution

Calculate the number of bacteria after 3 hours.

..... [2]

16 75 people are asked if they have a car, C, and if they have a job, J.
The Venn diagram shows the results.

View solution



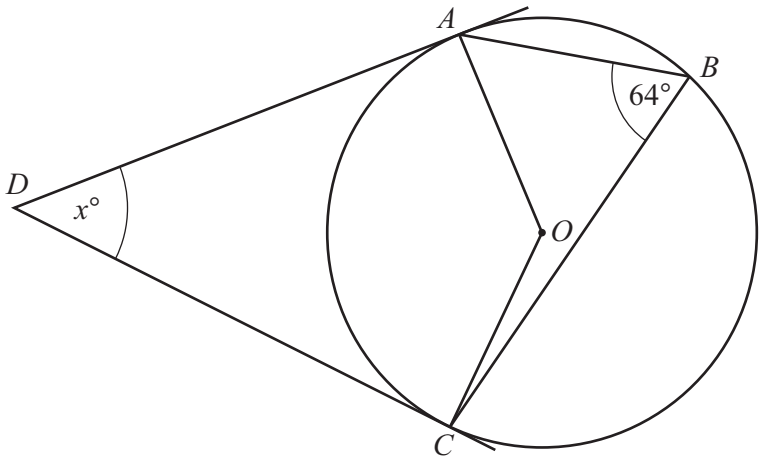
A person is chosen at random from those who have a car.

Find the probability that this person also has a job.

..... [1]

17

View solution



NOT TO SCALE

A, B and C are points on the circumference of a circle with centre O.
DA and DC are tangents to the circle.
Angle $ABC = 64°$.

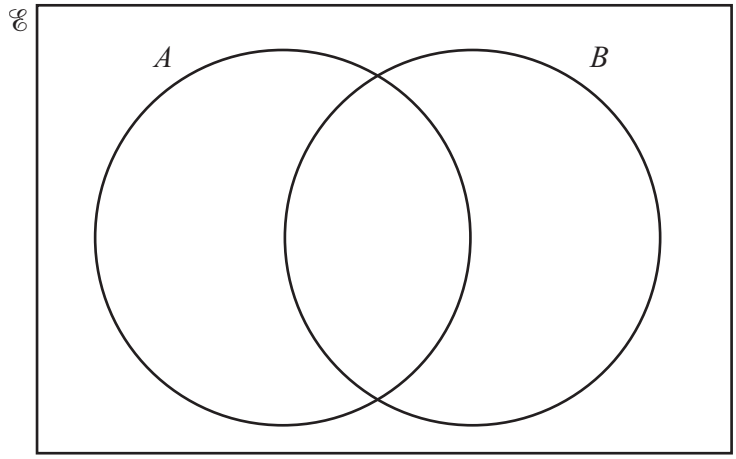
Work out the value of x.

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

18 **(a)** $\mathscr{E} = \{8 \times 10^{-1}, \quad 0.\dot{8}, \quad 8\%, \quad \sqrt{0.08}\}$

View solution

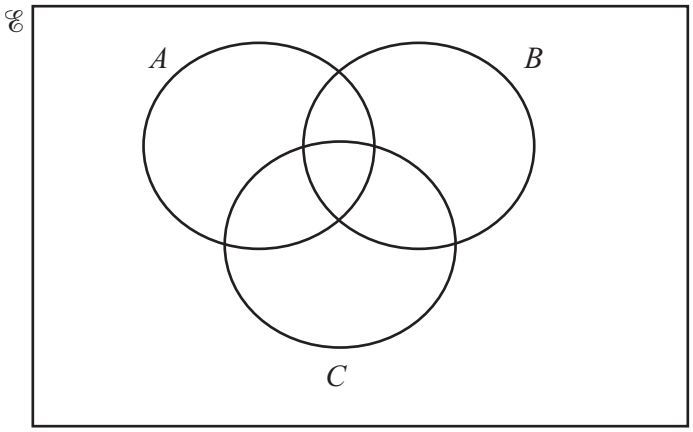
$A = \{ a: 0.08 < a \leqslant 0.8\}$
$B = \{ b: b \geqslant 0.8\}$



Complete the Venn diagram. [3]

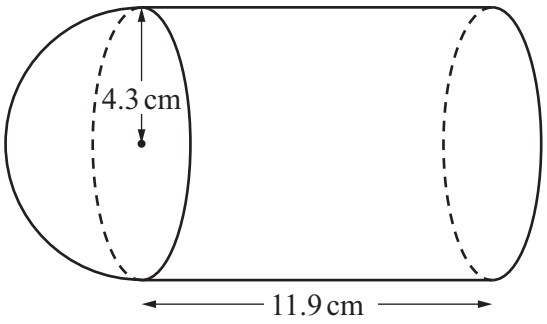
(b) Shade the region $(A \cup C) \cap B'$ in the Venn diagram.

View solution



[1]

19



NOT TO SCALE

A solid is made from a cylinder and a hemisphere, both of radius 4.3 cm.
The cylinder has length 11.9 cm.

View solution

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

..... cm^3 [3]

View solution

(b) Calculate the total surface area of the solid.
[The surface area, A, of a sphere with radius r is $A = 4\pi r^2$.]

..... cm^2 [4]

20 Find an expression for the nth term of this sequence.

View solution

$$\frac{1}{7}, \quad 1, \quad 7, \quad 49, \quad 343, \quad 2401, \quad \ldots$$

..... [2]

21 Expand and simplify.

View solution

$$(x+3)(x+5)(2x+1)$$

..... [3]

22 A is the point $(17, 9)$ and B is the point $(23, 39)$.

View solution

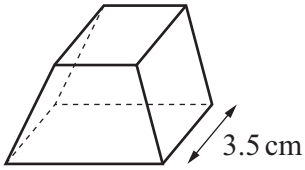
Find the equation of the perpendicular bisector of line AB.
Give your answer in the form $y = mx + c$.

$y =$ ..... [5]

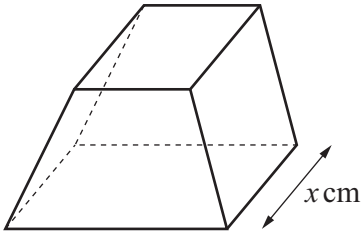
Question 23 is printed on the next page.

23

View solution



Small box



Large box

NOT TO SCALE

The small box is mathematically similar to the large box.
The volume of the large box is 72.8% greater than the volume of the small box.
The small box has length 3.5 cm and the large box has length x cm.

Calculate the value of x.

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

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