Cambridge Assessment International Education

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MATHEMATICS **0580/22**

Paper 2 (Extended) **October/November 2022**

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 **12** pages.

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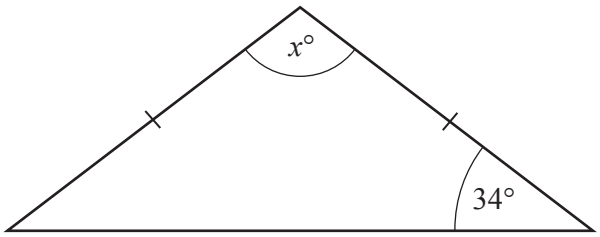
1



NOT TO SCALE

View solution

The diagram shows an isosceles triangle.

Find the value of x.

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

2 Simplify.

$$y \times 27 - y \times 77$$

View solution

..... [1]

3 Find the sum of 3^2 and -3^2.

View solution

..... [1]

4 Expand.

$$x(3 + x^2)$$

View solution

..... [2]

5 Jenna buys 2.4 m of ribbon and 4.8 m of fabric.
The total cost is $33.48 .
Ribbon costs $0.85 per metre.

View solution

Find the cost of 1 m of fabric.

$ ..... [3]

6 **(a)** These are the first five terms of a sequence.

View solution

27 26 23 18 11

Find the next two terms in the sequence.

..... , ... [2]

(b) The table shows information about two different sequences.

View solution

	First five terms of sequence					*n*th term
Sequence A	3	10	17	24	31	
Sequence B	2	11	26	47	74	

Complete the table.

[4]

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7 **Without using a calculator**, work out $\frac{5}{9} - \frac{1}{6}$.

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

View solution

..... [2]

8 Daryl records the number of hours in a week 8 people spend exercising.

5 2 1.5 3 18 4.5 2 4

(a) Find the median.

View solution

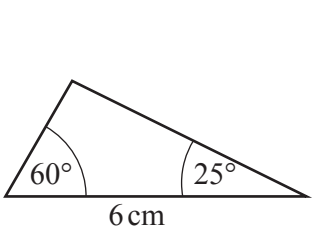
..... h [2]

(b) Explain why the mean may not be a suitable average to use.

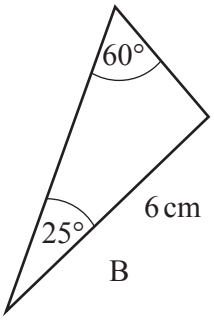
View solution

..... [1]

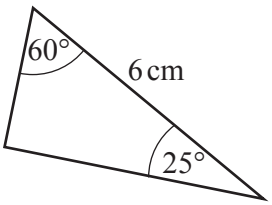
9 The diagram shows three triangles A, B and C.



A



B



C

NOT TO SCALE

(a) Which two of the triangles A, B and C are congruent with each other?

View solution

..... [1]

(b) Draw a ring around the congruence criterion that can be used to support your answer to **part (a)**.

SSS ASA SAS RHS

[1]

10 Calculate.

(a) 2000×1.2^3

View solution

..... [1]

(b) $2\frac{1}{8} \times \frac{6}{17}$

View solution

..... [1]

(c) $\frac{4.5(\cos 30°)}{\sqrt{3}} - 2$

View solution

..... [1]

11 The graph of $y = (x-3)(x+b)(x+2)$ intersects the y-axis at -30.

(a) Find the value of b.

View solution

$b =$ ..... [2]

(b) When $x > 0$ the graph crosses the x-axis once.

Write down the coordinates of this point.

View solution

(..... , ...) [1]

12 $x = 3^2 \times 5^2 \times 7 \times 199^{57}$ when written as a product of its prime factors.

Write $x \div 315$ as a product of its prime factors.

View solution

..... [2]

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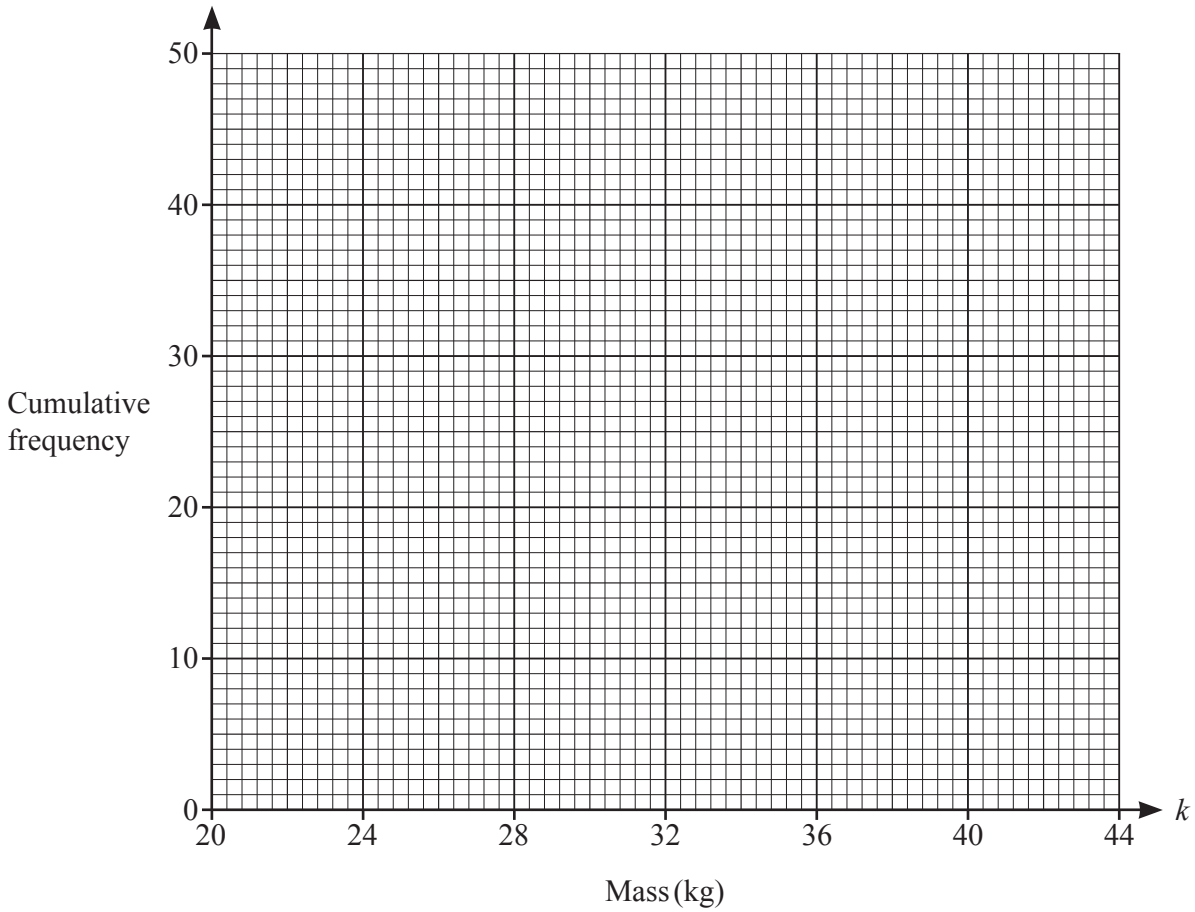
13 The table shows information about the mass of each of 50 children.

Mass (k kg)	Cumulative Frequency
$k \leqslant 20$	0
$k \leqslant 22$	7
$k \leqslant 24$	23
$k \leqslant 28$	35
$k \leqslant 32$	43
$k \leqslant 36$	47
$k \leqslant 42$	50

View solution

(a) Draw a cumulative frequency diagram to show this information.



[3]

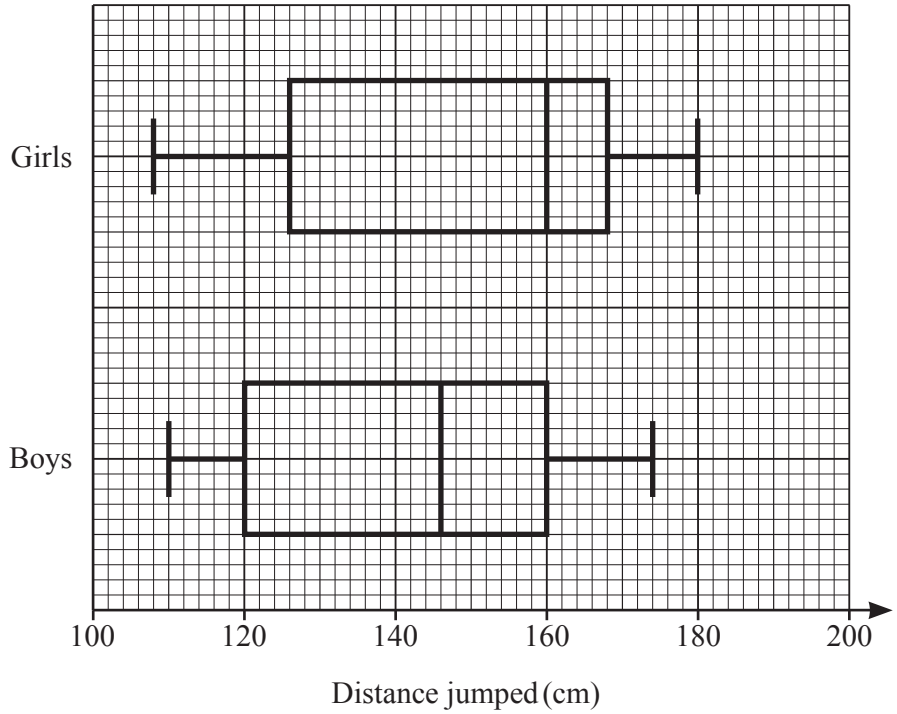
(b) Use your graph to find an estimate of the 90th percentile.

..... [1]

View solution

14 136 girls and 144 boys each measure the distance they jump in centimetres.
The box-and-whisker plots show the distributions of these distances.

View solution



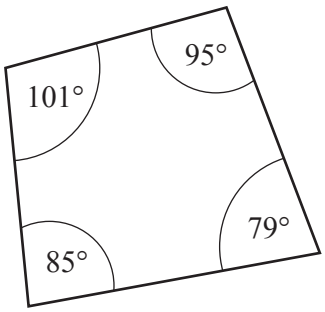
Each child who jumps a distance greater than 160 cm gets a certificate.

Work out an estimate of the total number of children who get a certificate.

..... [2]

15

View solution



NOT TO SCALE

The diagram shows a quadrilateral.

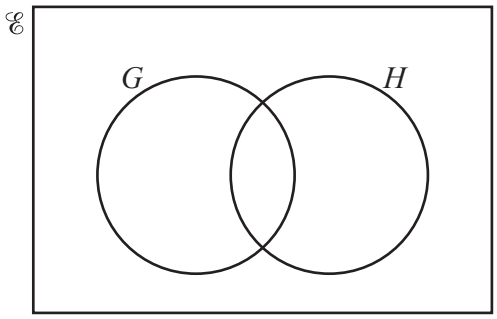
Give a geometrical reason why this is a cyclic quadrilateral.

..... [1]

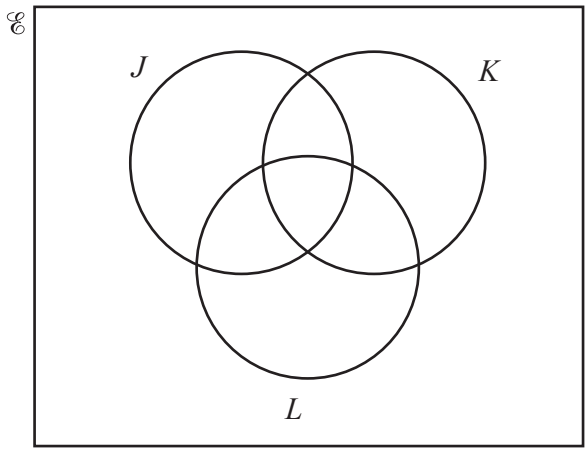
16 **(a)** Shade the region indicated in each Venn diagram.

View solution

$G \cap H'$



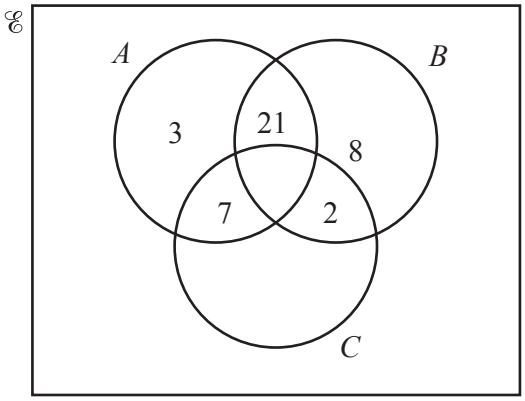
$(J \cup K') \cap L$



[2]

(b) The Venn diagram shows some information about the number of elements in sets A, B, C and $\mathscr{E}$.

View solution



Given the following information, complete the Venn diagram.

$n(A \cap B \cap C) = 1$
$n(A \cup B \cup C)' = 17$
$n(C) = 42$

[2]

17 $f(x) = x^2$ $g(x) = \frac{x+5}{2}$ $h(x) = 7x-3$

(a) Find $f(-3)$.

View solution

..... [1]

(b) Find $g^{-1}(x)$.

View solution

$g^{-1}(x) =$ ..... [2]

(c) Solve $gf(x) = hh^{-1}(63)$ where $x > 0$.

View solution

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

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18 Write $0.4\dot{1}\dot{9}$ as a fraction in its simplest form.
You must show all your working.

View solution

..... [3]

19 Katy picks a number at random from the numbers 2, 3 and 5.
She then picks a number at random from the numbers 5, 6, 7 and 9.
When she adds the two numbers the answer is even.

Find the probability that **exactly one** of the numbers picked is a 5.

View solution

..... [3]

20 Simplify fully.

(a) $(81x^{16})^{\frac{3}{4}}$

View solution

..... [2]

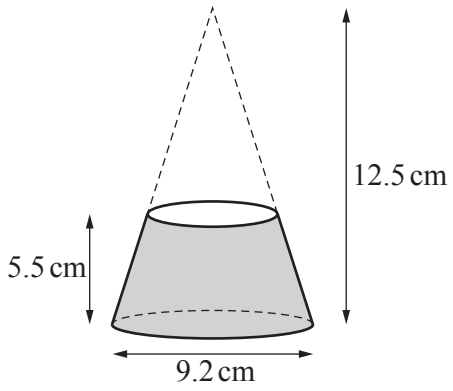
(b) $\left(\frac{1}{y^2}\right)^{-\frac{1}{2}}$

View solution

..... [1]

21

View solution



NOT TO SCALE

A solid is made by cutting a small cone from a larger cone, as shown in the diagram.
The height of the larger cone is 12.5 cm.
The height of the solid is 5.5 cm.
The diameter of the base of the larger cone is 9.2 cm.

Work out the volume of the solid.
[The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

..... cm^3 [4]

Questions 22 and 23 are printed on the next page.

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22 The volumes of two mathematically similar objects are $56\,\text{cm}^3$ and $875\,\text{cm}^3$.
The height of the smaller object is 18 cm.

View solution

Find the height of the larger object.

..... cm [3]

23 Solve $\dfrac{4}{x+1} + \dfrac{2}{2x-5} = 3$.

View solution

You must show all your working.

$x =$ ..... or $x =$ ..... [7]

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