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CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/33

Paper 3 (Core)

October/November 2023

1 hour 45 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 graphic display calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly and you will be given marks for correct methods, including sketches, even if your answer is incorrect.
- 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 your calculator value.

INFORMATION

- The total mark for this paper is 96.
- The number of marks for each question or part question is shown in brackets [].

This document has **16** pages.

Formula List

Area, A , of triangle, base b , height h .

$$A = \frac{1}{2}bh$$

Area, A , of circle, radius r .

$$A = \pi r^2$$

Circumference, C , of circle, radius r .

$$C = 2\pi r$$

Curved surface area, A , of cylinder of radius r , height h .

$$A = 2\pi rh$$

Curved surface area, A , of cone of radius r , sloping edge l .

$$A = \pi rl$$

Curved surface area, A , of sphere of radius r .

$$A = 4\pi r^2$$

Volume, V , of prism, cross-sectional area A , length l .

$$V = Al$$

Volume, V , of pyramid, base area A , height h .

$$V = \frac{1}{3}Ah$$

Volume, V , of cylinder of radius r , height h .

$$V = \pi r^2 h$$

Volume, V , of cone of radius r , height h .

$$V = \frac{1}{3}\pi r^2 h$$

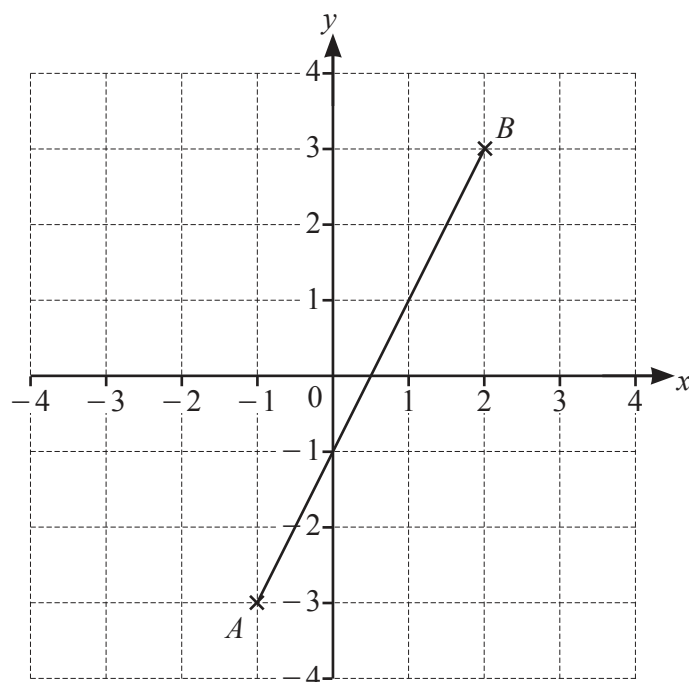
Volume, V , of sphere of radius r .

$$V = \frac{4}{3}\pi r^3$$

3

Answer **all** the questions.

- 1 The line AB is drawn on a 1 cm square grid.



- (a) Write down the coordinates of point A and point B .

$A = (\dots\dots\dots , \dots\dots\dots)$

$B = (\dots\dots\dots , \dots\dots\dots)$ [2]

- (b) Write down the coordinates of the mid-point of AB .

$(\dots\dots\dots , \dots\dots\dots)$ [1]

- (c) On the grid, plot point C at $(2, -2)$. [1]

- (d) On the grid, draw a straight line through C , parallel to AB . [1]

- (e) On the grid, draw a straight line through B , perpendicular to AB . [1]

4

- 2 (a) (i) Write 17852 in words.

.....
 [1]

- (ii) Write 17852 correct to the nearest 100.

..... [1]

- (iii) Write 17852 correct to 2 significant figures.

..... [1]

- (b) (i) Write down a multiple of 10.

..... [1]

- (ii) Write down a factor of 20.

..... [1]

- (iii) Write down a prime number between 10 and 20.

..... [1]

- (c) Find the value of

(i) 6^2

..... [1]

(ii) 4^5 .

..... [1]

- (d) (i) Find the value of n when $\frac{3}{10} = \frac{n}{30}$.

$n =$ [1]

- (ii) Write these fractions in order of size, starting with the smallest.

$$\frac{2}{5} \quad \frac{1}{3} \quad \frac{11}{30} \quad \frac{3}{10}$$

..... [2]
smallest

5

(e) Work out the following, giving your answers as fractions.

(i) $\frac{2}{5} - \frac{1}{3}$

..... [1]

(ii) $1\frac{1}{2} \times \frac{11}{30}$

..... [1]

3 (a) Simplify.

$$3x + 5y + 7 - 2x + 4y - 9$$

..... [3]

(b) Factorise completely.

$$6x + 15x^2$$

..... [2]

(c) Solve.

$$4(x + 7) = 20$$

$x =$ [2]

(d) (i) Solve the inequality $3x - 2 < 4$.

..... [2]

(ii) Write down the largest possible integer value of x for $3x - 2 < 4$.

$x =$ [1]

6

- 4 Inaya surveys the eye colour of everyone in her class.
The table shows her results.

Eye colour	Blue	Brown	Green	Grey	Other
Number of students	5	8	10	7	2

(a) Find how many students are in the survey.

..... [1]

(b) What is the most common eye colour?

..... [1]

(c) One of the students is chosen at random.

Find the probability that this student has grey eyes.

..... [1]

(d) One of the students is chosen at random.

Find the probability that this student has blue eyes or brown eyes.

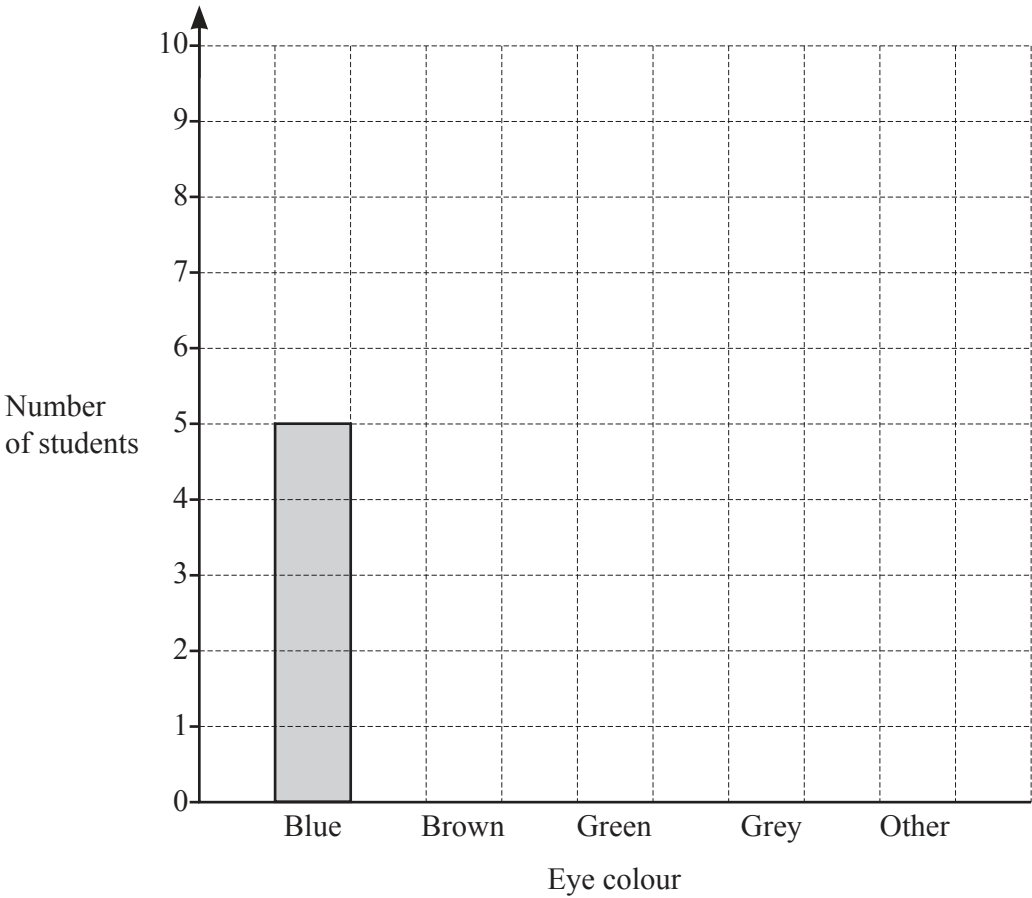
..... [1]

(e) There are 256 students in the school.

Work out an estimate of how many of these students have green eyes.

..... [2]

(f) Complete the bar chart to show the information in the table.



[2]

- 5 This is a sign at a golf club.

<u>AAA GOLF CLUB</u>
One round of golf: \$24 each player
Golf balls: \$2.25 each

- (a) 4 friends go to the golf club to play one round of golf.
They each buy 3 golf balls.

Work out the total that they pay.

\$ [3]

- (b) Ali and Ben are senior golf players.
The golf club offers each senior player a 12% discount.
Ali pays for them both to play one round of golf.

Work out how much he pays.

\$ [3]

- (c) There are 288 members of AAA Golf Club.
The members are in the ratio

male : female = 5 : 4 .

Work out how many males and how many females are members of AAA Golf Club.

male

female [2]

9

(d) These are the scores Lennie has in 10 rounds of golf.

91 76 102 73 82 89 88 71 92 86

(i) Find the mean.

..... [1]

(ii) Find the median.

..... [1]

(iii) Draw a stem-and-leaf diagram for the ten scores.

Key : | means [3]

(iv) Find the range of the ten scores.

..... [1]

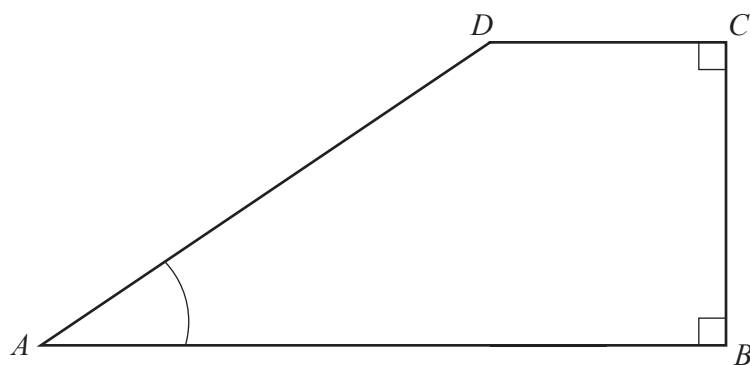
(v) Lennie plays one more round of golf.
After this, the range of his scores is 35.

Work out the possible scores for that last round of golf.

..... [2]

10

- 6 (a) The diagram shows a quadrilateral $ABCD$.



- (i) Write down the mathematical name for this quadrilateral.

..... [1]

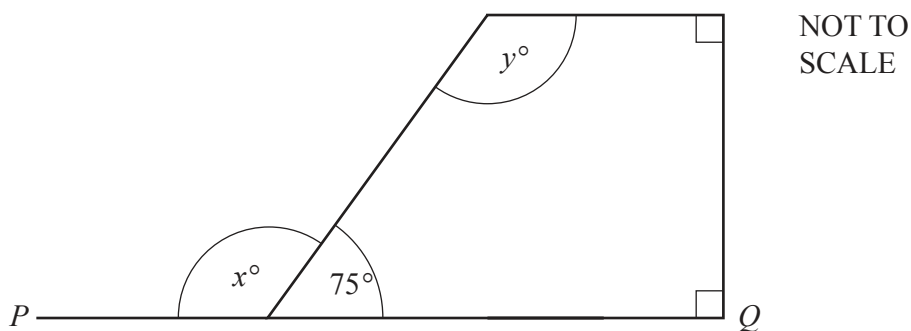
- (ii) Give a geometric reason for choosing your answer to **part (i)**.

..... [1]

- (iii) Measure angle BAD .

Angle $BAD =$ [1]

(b)



Here is another quadrilateral.
 PQ is a straight line.

- (i) Find the value of x .

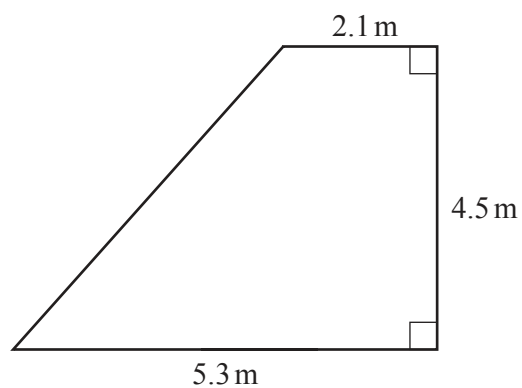
$x =$ [1]

- (ii) Find the value of y .

$y =$ [1]

11

(c) Here is a different quadrilateral.



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(i) Find the area of this quadrilateral.

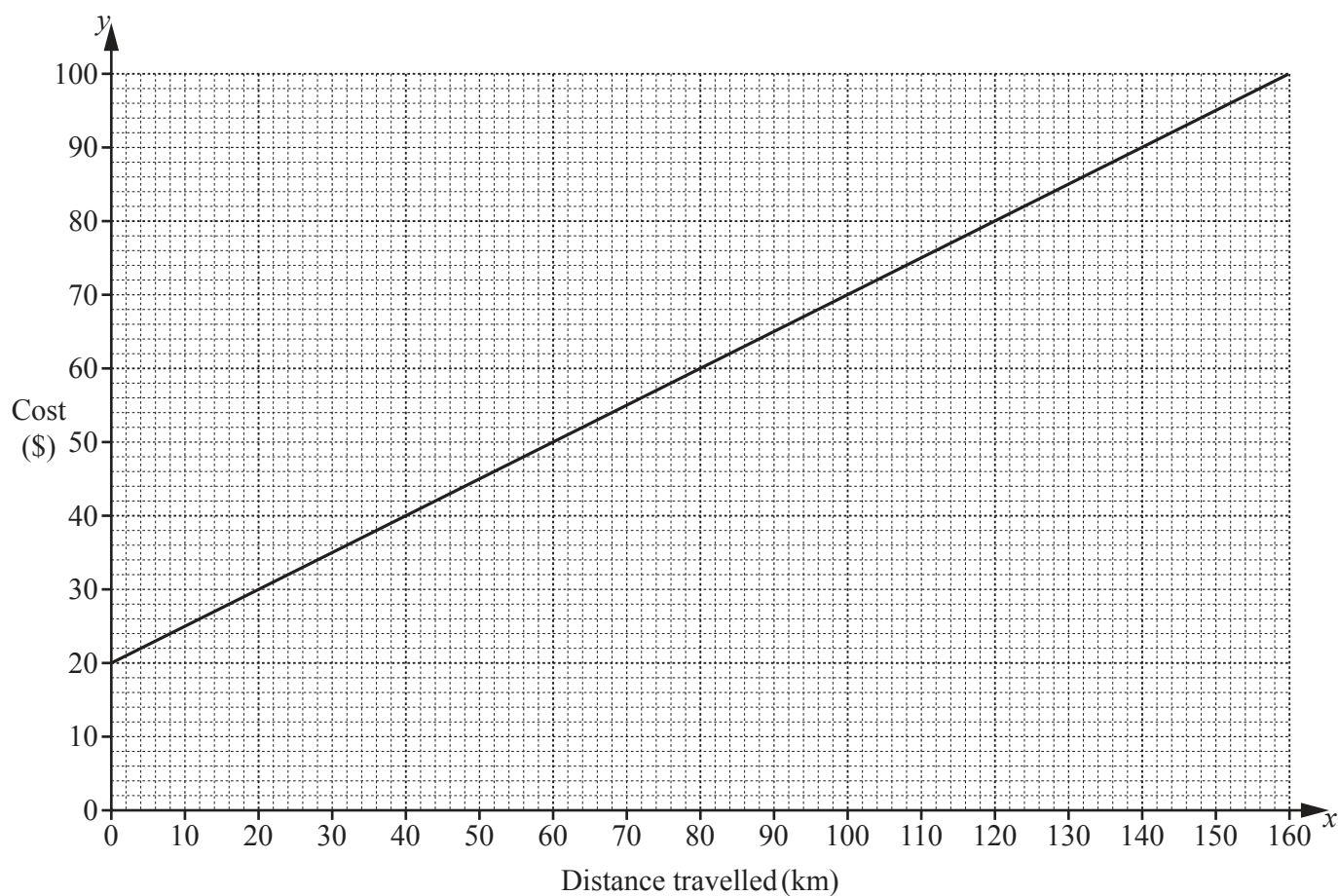
..... m^2 [3]

(ii) Find the perimeter of this quadrilateral.

..... m [4]

12

- 7 The graph shows the cost of hiring a car.
The cost, \$ y , depends on the distance, x km, travelled in the car.



- (a) Paul hires a car and travels a distance of 120 km.

Find how much this costs him.

\$ [1]

- (b) Bushra hires a car.
It costs her \$50.

Find the distance she travels.

..... km [1]

- (c) Find the equation of the line drawn on the grid.
Give your answer in the form $y = mx + c$.

..... [3]

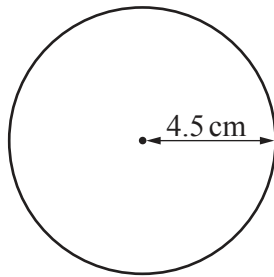
13

(d) Carmen hires a car and travels a distance of 350 km.

Using your answer to **part (c)**, work out how much this costs her.

\$ [2]

8



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x cm

The area of the circle is equal to the area of the square.
The length of one side of the square is x cm.

Find the value of x .

$x =$ [4]

14**9 (a)** Simplify.

(i) $x^6 \times x^3$

..... [1]

(ii) $\frac{10x^7}{5x^2}$

..... [2]

(b) Expand and simplify.

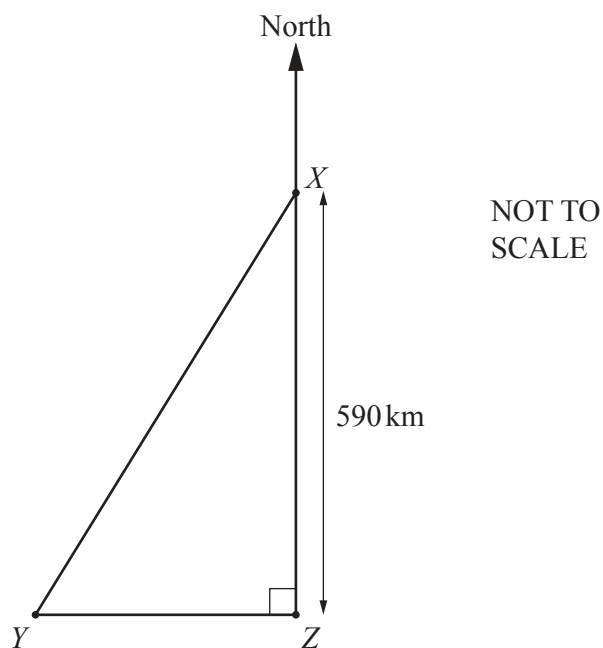
$(x+9)(x-4)$

..... [2]

(c) Rearrange $P = \frac{K+B}{2}$ to make K the subject. $K =$ [2]

15

10



X , Y and Z are three towns.
 Z is 590 km due South of X .
 Y is due West of Z .
 The bearing of Y from X is 220° .

(a) Use trigonometry to calculate the distance XY .

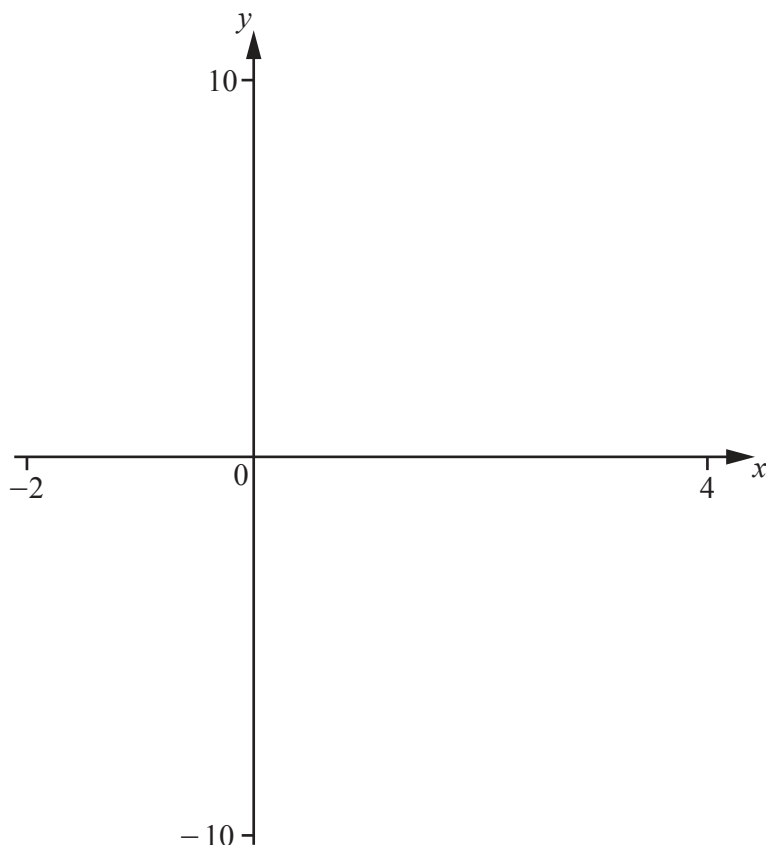
..... km [4]

(b) Work out the bearing of X from Y .

..... [1]

Question 11 is printed on the next page.

11



(a) (i) On the diagram, sketch the graph of $y = x^2 - x - 4$ for $-2 \leq x \leq 4$. [2]

(ii) Find the coordinates of the local minimum.

(..... ,) [2]

(b) On the diagram, sketch the graph of $y = -x^2 + 3x + 2$ for $-2 \leq x \leq 4$. [2]

(c) Find the x -coordinate of each point of intersection of $y = x^2 - x - 4$ and $y = -x^2 + 3x + 2$.

$x = \dots\dots\dots$ and $x = \dots\dots\dots$ [2]

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