CANDIDATE NAME	
CLASS / GROUP	
DATE	

MATHEMATICS

Paper 3 Calculator (Core)

1 hour 30 minutes

You must answer on the question paper.

You will need: Geometrical instruments · Scientific calculator

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 and class 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 show all your working in the booklet.
- You may use a calculator.
- 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.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].
- This document has 12 pages, including a list of formulas.

For teacher use

Total
/ 80

Questions adapted from Cambridge IGCSE 0580 past papers (© UCLES) for classroom practice.
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List of formulas (Core)

Area, A, of triangle, base b, height h.	$\mathbf{A = \frac{1}{2}bh}$
Area, A, of circle of radius r.	$\mathbf{A = \pi r^2}$
Circumference, C, of circle of radius r.	$\mathbf{C = 2\pi r}$
Curved surface area, A, of cylinder of radius r, height h.	$\mathbf{A = 2\pi rh}$
Curved surface area, A, of cone of radius r, sloping edge l.	$\mathbf{A = \pi rl}$
Surface area, A, of sphere of radius r.	$\mathbf{A = 4\pi r^2}$
Volume, V, of prism, cross-sectional area A, length l.	$\mathbf{V = Al}$
Volume, V, of pyramid, base area A, height h.	$\mathbf{V = \frac{1}{3}Ah}$
Volume, V, of cylinder of radius r, height h.	$\mathbf{V = \pi r^2 h}$
Volume, V, of cone of radius r, height h.	$\mathbf{V = \frac{1}{3}\pi r^2 h}$
Volume, V, of sphere of radius r.	$\mathbf{V = (4/3)\pi r^3}$
Area, A, of parallelogram, base b, perpendicular height h.	$\mathbf{A = bh}$
Area, A, of trapezium, parallel sides a and b, height h.	$\mathbf{A = \frac{1}{2}(a + b)h}$

1 A concert hall has 1540 seats.

Calculate the number of people in the hall when 55% of the seats are occupied.

Answer ..... [1]

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2 At a theatre, adult tickets cost \$5 each and child tickets cost \$3 each.

(a) Find the total cost of 110 adult tickets and 85 child tickets.

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

(b) The total cost of some tickets is \$750.
There are 120 adult tickets.

Work out the number of child tickets.

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

(c) The ratio of the **number** of adults to the **number** of children during one performance is

adults : children = 3 : 2.

(i) The total number of adults and children in the theatre is 150.

Find the number of adults in the theatre.

Answer(c)(i) ..... [2]

(ii) For this performance, find the ratio **total cost** of adult tickets : **total cost** of child tickets.
Give your answer in its simplest form.

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

(d) The \$5 cost of an adult ticket is increased by 30%.

Calculate the new cost of an adult ticket.

Answer(d) \$ ..... [2]

(e) The cost of a child ticket is reduced from \$3 to \$2.70.

Calculate the percentage decrease in the cost of a child ticket.

Answer(e) ..... % [3]

3 **(a)** $x = 3m - k$

Find the value of

(i) x when $m = 2$ and $k = -4$,

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

(ii) m when $x = 19$ and $k = 5$.

Answer(a)(ii) ..... [3]

(b) Expand the brackets.

$g(7f - g^2)$

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

(c) Factorise completely.

$18h^2 - 12hj$

Answer(c) ..... [2]

(d) Make m the subject of the formula.

$t = 8m + 15$

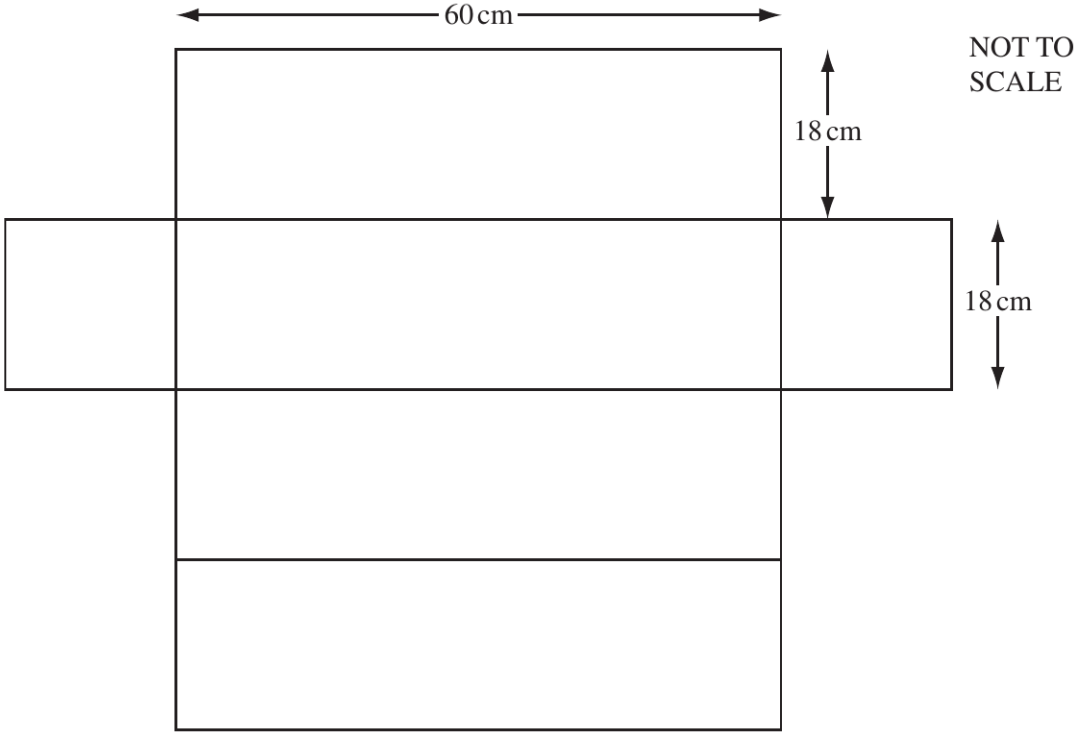
Answer(d) $m =$ ..... [2]

(e) Solve the equation.

$p + 3 = 3(p - 5)$

Answer(e) $p =$ ..... [3]

4



The diagram shows the net of a box.

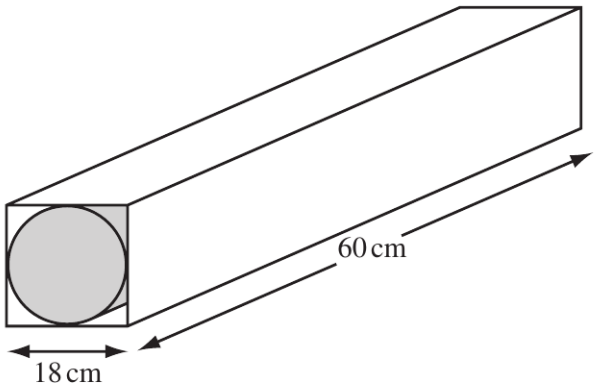
(a) (i) Calculate the **total** surface area of the box.

Answer(a)(i) ..... cm^2 [2]

(ii) Calculate the volume of the box.

Answer(a)(ii) ..... cm^3 [2]

(b) A cylinder with **diameter** 18 cm and length 60 cm just fits inside the box.



NOT TO SCALE

(i) Calculate the volume of the cylinder.

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

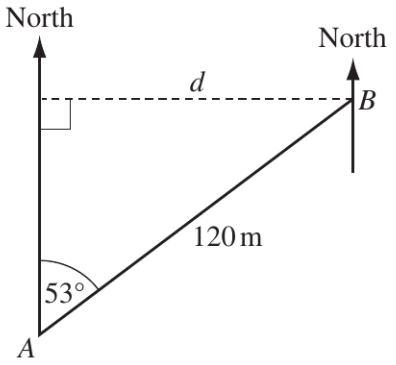
(ii) Find the volume of space outside the cylinder but inside the box.

Answer(b)(ii) ..... cm^3 [1]

(iii) Calculate the curved surface area of the cylinder.

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

5 **(a)**



NOT TO SCALE

B is 120 m from *A* on a bearing of 053°.
Calculate

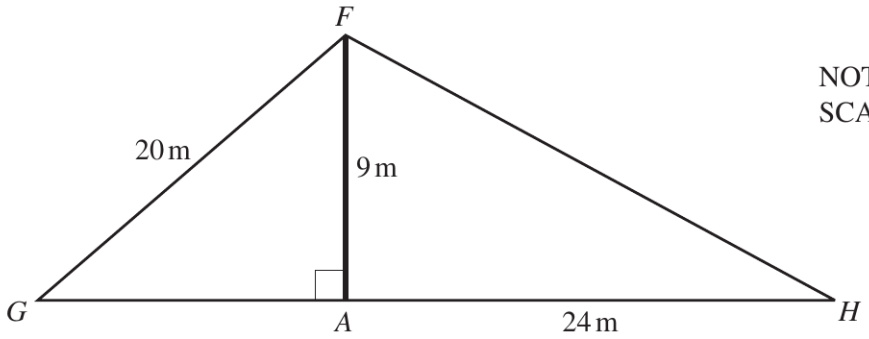
(i) the distance *d*,

Answer(a)(i) *d* = ... m [2]

(ii) the bearing of *A* from *B*.

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

(b)



NOT TO SCALE

A vertical flagpole, *AF*, is 9 m high.
It is held in place by two straight wires *FG* and *FH*.
FG = 20 m and *AH* = 24 m.
G, *A* and *H* lie in a straight line on horizontal ground.
Calculate

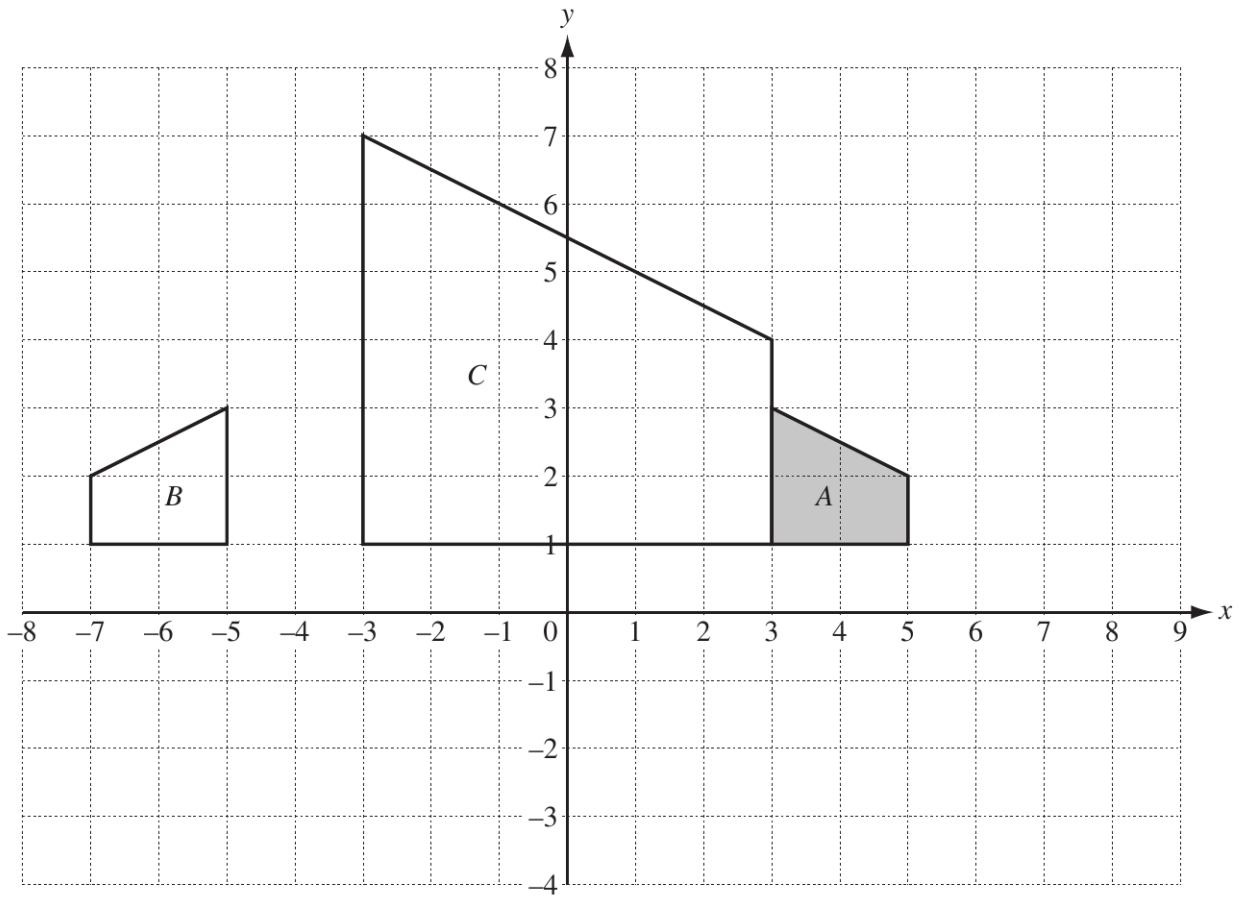
(i) angle *FHA*,

Answer(b)(i) Angle *FHA* = ... [2]

(ii) the distance *GA*.

Answer(b)(ii) *GA* = ... m [3]

6



(a) On the grid, draw the images of the following transformations of **shape *A***.

(i) Reflection in the x-axis [1]

(ii) Translation by the vector $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ [2]

(iii) Rotation, centre (0, 0), through 180° [2]

(b) Describe fully the **single** transformation that maps

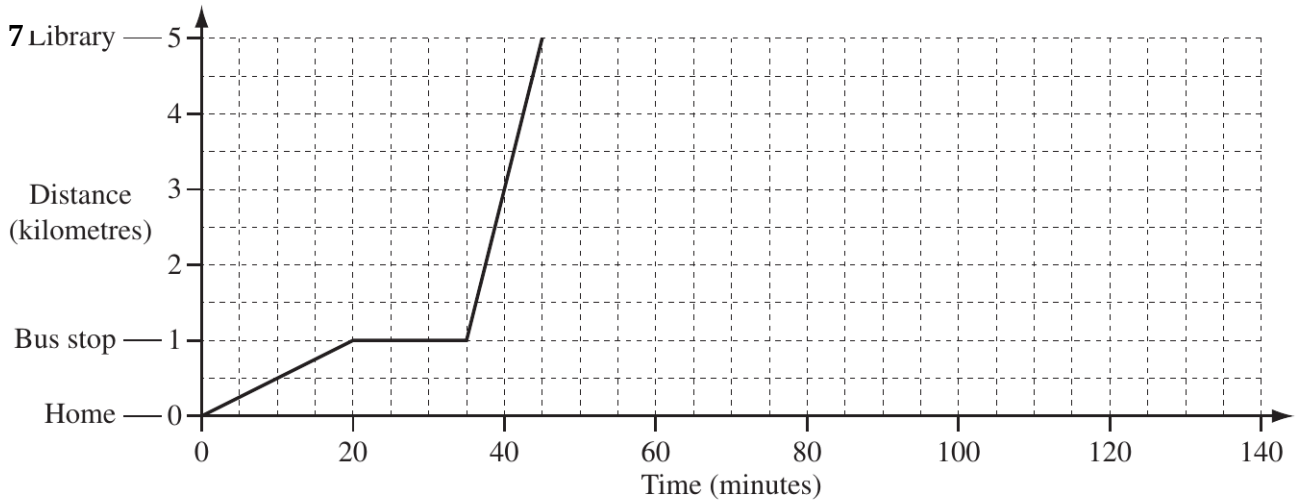
(i) shape A onto shape B,

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

(ii) shape A onto shape C.

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

7



Sonia travels from home to the library.
She walks to the bus stop and waits for a bus to take her to the library.

(a) Write down

(i) the distance to the bus stop,

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

(ii) how many minutes Sonia waits for a bus,

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

(iii) how many minutes the bus journey takes to the library.

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

(b) Calculate, in **kilometres per hour**,

(i) Sonia's walking speed,

Answer(b)(i) ..... km/h [1]

(ii) the speed of the bus,

Answer(b)(ii) ..... km/h [2]

(iii) the **average** speed for Sonia's journey from home to the library.

Answer(b)(iii) ..... km/h [3]

(c) Sonia works in the library for one hour.
Then she travels home by car.
The average speed of the car is 30 km/h.

Complete the travel graph. [2]

8 30 students took a vocabulary test.
The marks they scored are shown below.

7	8	5	8	3	2
6	6	3	3	6	2
7	1	5	10	2	6
6	5	8	1	2	7
3	1	5	3	10	3

(a) Complete the frequency table below.

The first five frequencies have been completed for you.
You may use the tally column to help you.

Mark	Tally	Frequency
1		3
2		4
3		6
4		0
5		4
6		
7		
8		
9		
10		

[3]

(b) **(i)** Find the range.

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

(ii) Write down the mode.

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

(iii) Find the median.

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

(iv) Calculate the mean.

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

(c) A student is chosen at random.

Find the probability that the student scored

(i) 1 mark,

Answer(c)(i) ..... [1]

(ii) 4 marks,

Answer(c)(ii) ..... [1]

(iii) fewer than 6 marks.

Answer(c)(iii) ..... [1]

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