Write your name here

Surname	Other names

Pearson Edexcel International GCSE

Centre Number	Candidate Number

Mathematics A

Practice paper 2H



Higher Tier

Time: 2 hours

Paper Reference **4MA1/PP2H**

You must have:
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need*.
- **Calculators may be used.**
- You must **NOT** write anything on the formula page.
  Anything you write on the formulae page will gain no credit.

Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question*.

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

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Arithmetic series

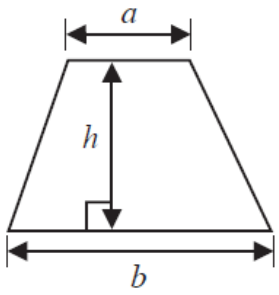
Sum to n terms, $S_n = \frac{n}{2}[2a + (n-1)d]$

The quadratic equation

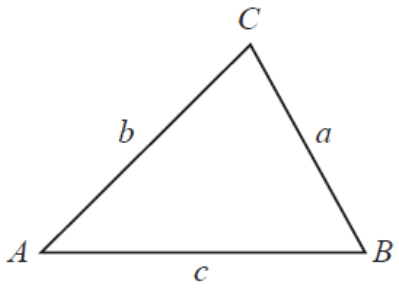
The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Area of trapezium $= \frac{1}{2}(a+b)h$



Trigonometry



In any triangle ABC

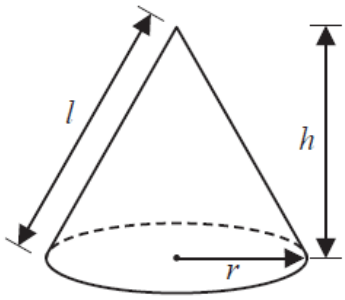
Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

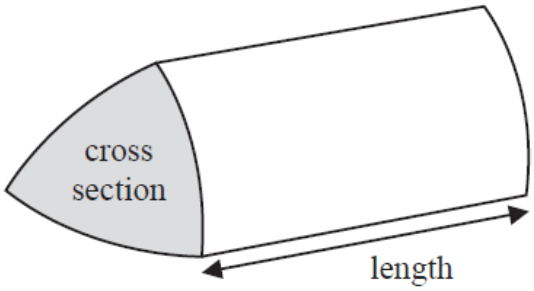
Area of triangle $= \frac{1}{2}ab\sin C$

Volume of cone $= \frac{1}{3}\pi r^2 h$

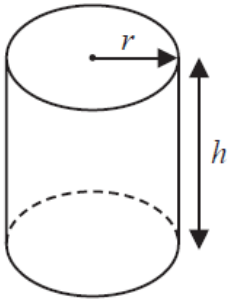
Curved surface area of cone $= \pi r l$



Volume of prism
= area of cross section × length

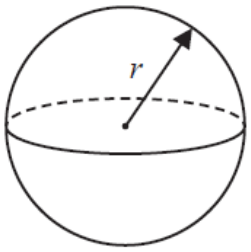


Volume of cylinder $= \pi r^2 h$
Curved surface area of cylinder $= 2\pi r h$



Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$



Answer ALL TWENTY THREE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 $\mathscr{E}$= {4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15}

A = {multiples of 5}

B = {odd numbers}

(*a*) List the members of the set

(i) $A \cap B$

.....

(ii) $A \cup B$

.....

(2)

The set C has 6 members and $B \cap C = \emptyset$

(*b*) List the members of set C.

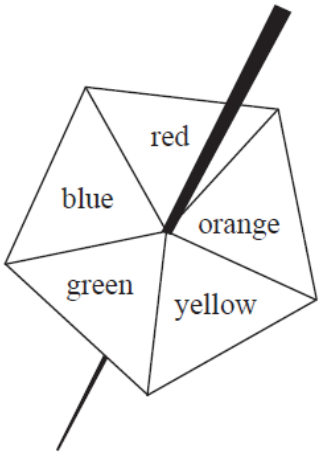
.....

(2)

(Total for Question 1 is 4 marks)

---

2 Here is a biased five-sided spinner.



When the spinner is spun, it can land on red, orange, yellow, green or blue.
The probabilities that it lands on red, orange and yellow are given in the table.

Colour	red	orange	yellow	green	blue
Probability	0.4	0.2	0.1		

The probability that the spinner lands on green is the same as the probability that the spinner lands on blue.

Michael spins the spinner once.

(*a*) Work out the probability that the spinner lands on green.

.....

(3)

Jenny spins the spinner 200 times.

(*b*) Work out an estimate for the number of times the spinner lands on red.

.....

(2)

(Total for Question 2 is 5 marks)

3 $D = 7c^2 + f$

(*a*) Work out the value of D when $c = -2$ and $f = 5$

$D =$ .....

(2)

(*b*) Solve the inequality $3 - 7t \geq 31$

.....

(2)

(*c*) Expand and simplify $(x - 9)(x + 2)$

.....

(2)

(Total for Question 3 is 6 marks)

---

4 Simplify $(2x + 3)^2 - (2x + 3)(x - 5)$

Give your answer in the form $ax^2 + bx + c$

.....

(Total for Question 4 is 3 marks)

---

5 In a sale, normal prices are reduced by 18%
The sale price of an umbrella is £25.83.

Work out the normal price of the umbrella.

£.....

(Total for Question 5 is 3 marks)

---

6 Each interior angle of a regular polygon is 156°

Work out the number of sides of the polygon.

.....

(Total for Question 6 is 3 marks)

---

7 Manu, Liam and Ned share £420 in the ratios 4 : 5 : 3
Liam then gives Ned £75.

Express the amount of money that Ned now has as a percentage of the £420.
Give your answer correct to the nearest whole number.

..... %

(Total for Question 7 is 4 marks)

---

8 (*a*) Simplify $e^8 \times e^7$

.....

(1)

(*b*) Simplify fully $\dfrac{12g^{10}}{3g^2}$

.....

(2)

(*c*) Simplify $(e^5)^3$

.....

(1)

(*d*) Write down the value of m^0

.....

(1)

(*e*) Simplify fully $\left(27x^6\right)^{\frac{2}{3}}$

.....

(2)

(Total for Question 8 is 7 marks)

9

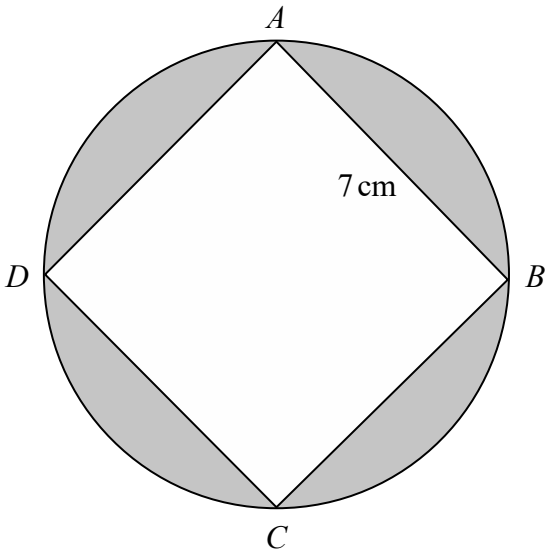


Diagram **NOT** accurately drawn

A, *B*, *C* and *D* are points on a circle.
ABCD is a square of side 7 cm.

Work out the total area of the shaded regions.
Give your answer correct to the nearest whole number.

..... cm^2

(Total for Question 9 is 5 marks)

10 Here are the heights, in millimetres, of 11 seedlings.

16 12 19 17 24 27 19 15 23 27 10

Work out the interquartile range of these heights.

..... mm

(Total for Question 10 is 3 marks)

11 Here are the equations of four straight lines.

Line **A**	y	$= 2x + 3$
Line **B**	$2y$	$= 6 - 3x$
Line **C**	$4x - 2y$	$= 3$
Line **D**	y	$= 3 - 2x$

Two of these lines are parallel.

(*a*) Which two lines?

.....

(2)

Line **L** has a gradient of $-\frac{5}{2}$ and passes through the point with coordinates (1, 3)

(*b*) Find an equation of **L**.
Give your answer in the form $ax + by = c$ where a, b and c are integers.

.....

(3)

(Total for Question 11 is 5 marks)

12

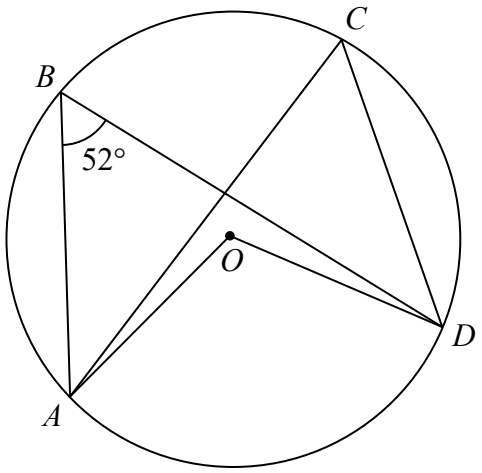


Diagram **NOT** accurately drawn

A, *B*, *C* and *D* are points on a circle, centre *O*.
Angle *ABD* = 52°

(*a*) (i) Write down the size of angle *ACD*.

..... °

(ii) Give a reason for your answer.

.....

.....

(2)

(*b*) (i) Write down the size of angle *AOD*.

..... °

(ii) Give a reason for your answer.

.....

.....

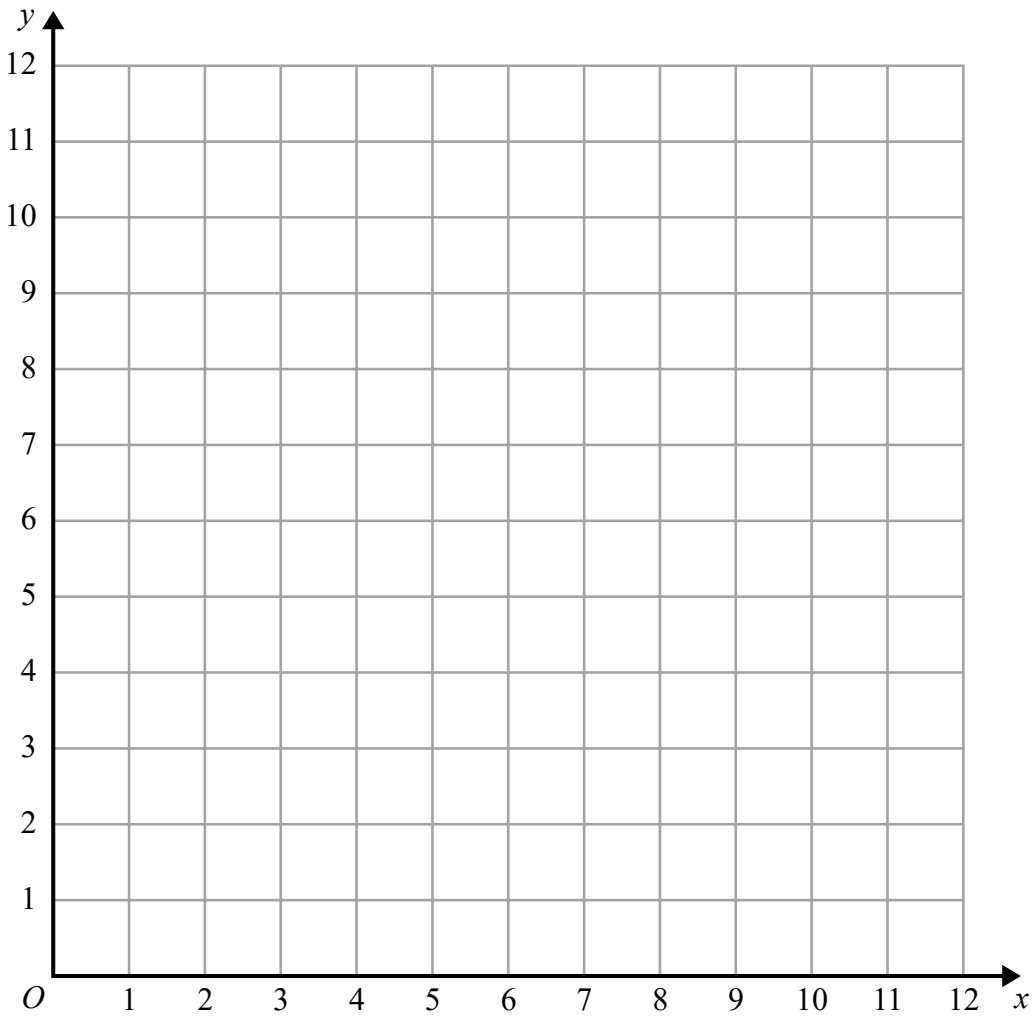
(2)

(Total for Question 12 is 4 marks)

13 On the grid, show by shading the region defined by the inequalities

$y > 5$ and $y < 2x + 1$ and $x + y < 10$

Label your region **R**.



(Total for Question 13 is 3 marks)

14 Here is a trapezium.

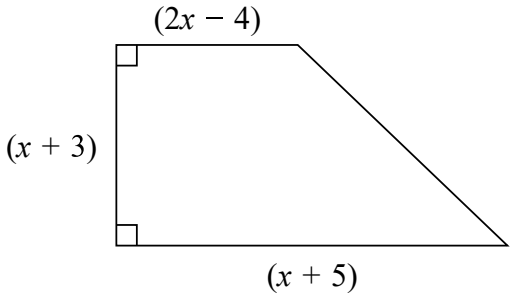


Diagram **NOT** accurately drawn

All measurements are in centimetres.

The area of the trapezium is 60 cm^2

(*a*) Show that $3x^2 + 10x - 117 = 0$

(3)

(*b*) Work out the value of x.
Show your working clearly.
Give your answer correct to 3 significant figures.

.....

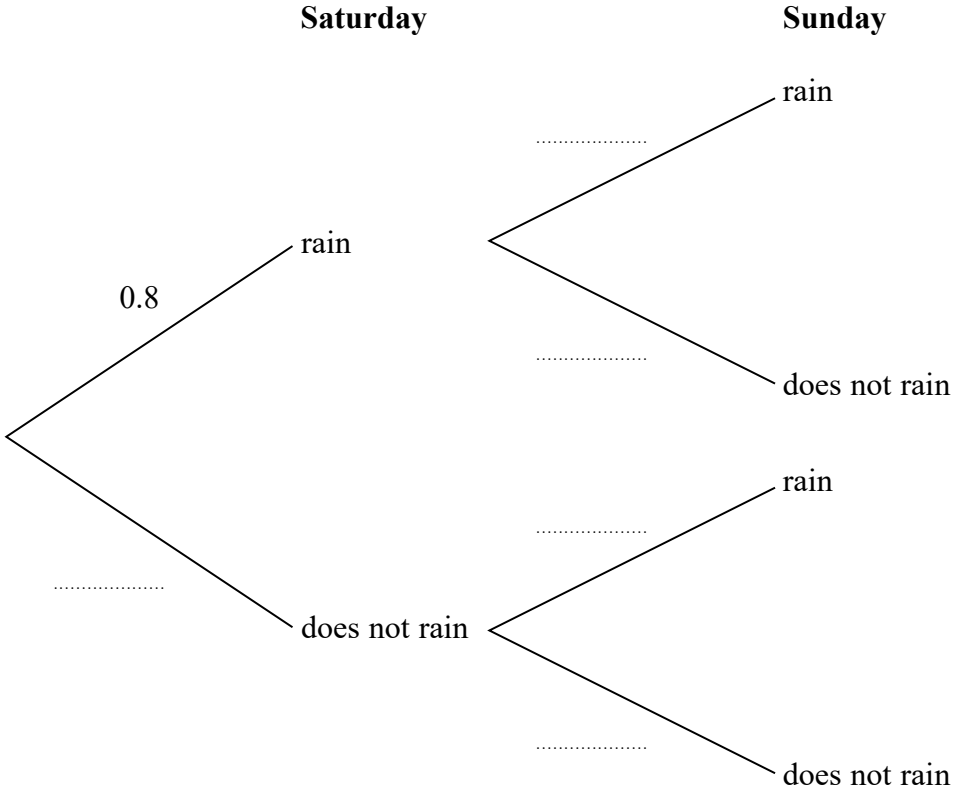
(3)

(Total for Question 14 is 6 marks)

15 The probability that it will rain on Saturday is 0.8.

If it rains on Saturday, the probability that it will rain on Sunday is 0.65.
If it does not rain on Saturday, the probability that it will rain on Sunday is 0.4.

(*a*) Use this information to complete the probability tree diagram.



(2)

(*b*) Work out the probability that it will rain on just one of these two days.

.....

(3)

(Total for Question 15 is 5 marks)

16 Curve **C** has equation $y = 8x^3 - 3x^2 - 25x$

(*a*) Find $\frac{dy}{dx}$

.....

(2)

(*b*) Find the x coordinates of the points on **C** where the gradient is 5.
Show clear algebraic working.

.....

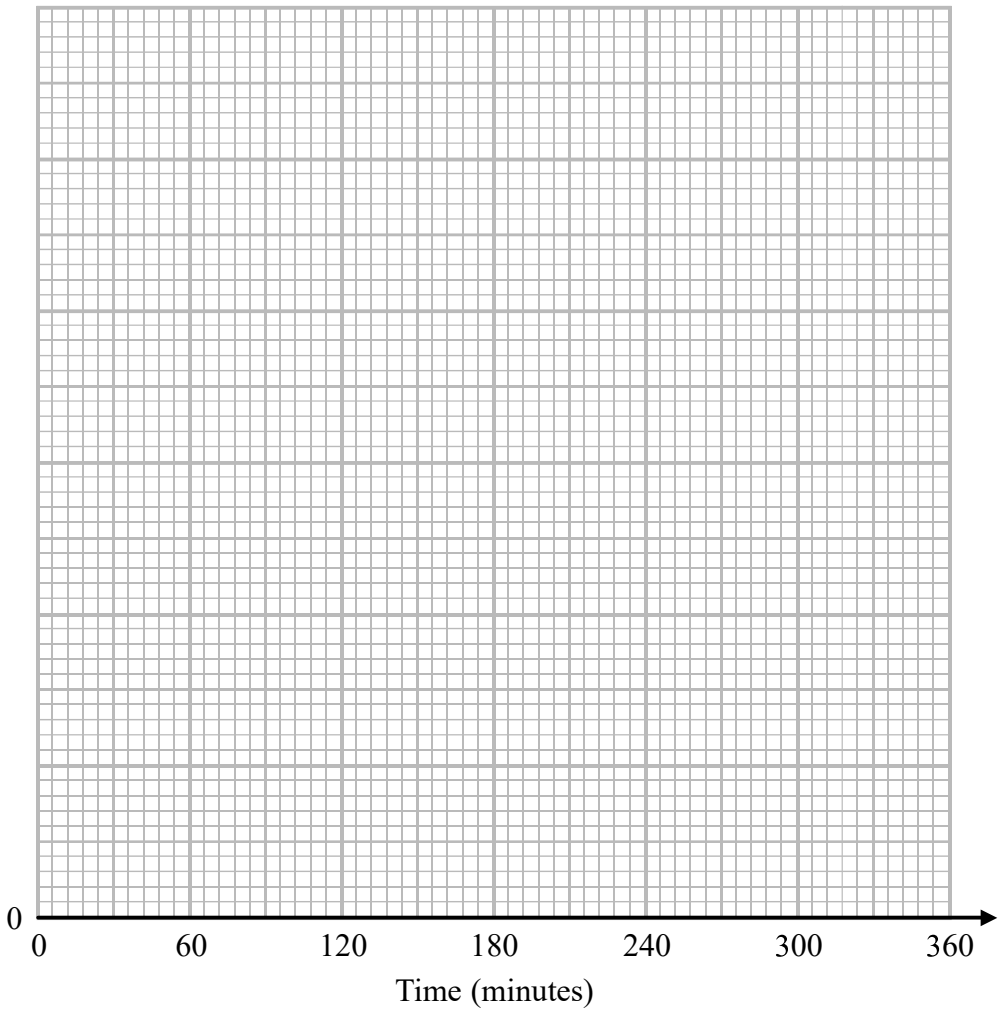
(4)

(Total for Question 16 is 6 marks)

17 The table gives information about the times, in minutes, some people waited in the accident and emergency department at a hospital.

Time (t minutes)	Frequency
$0 < t \leqslant 30$	60
$30 < t \leqslant 90$	270
$90 < t \leqslant 120$	150
$120 < t \leqslant 240$	156
$240 < t \leqslant 300$	24

On the grid, draw a histogram for this information.



(Total for Question 17 is 3 marks)

18 *ABCD* is a kite.

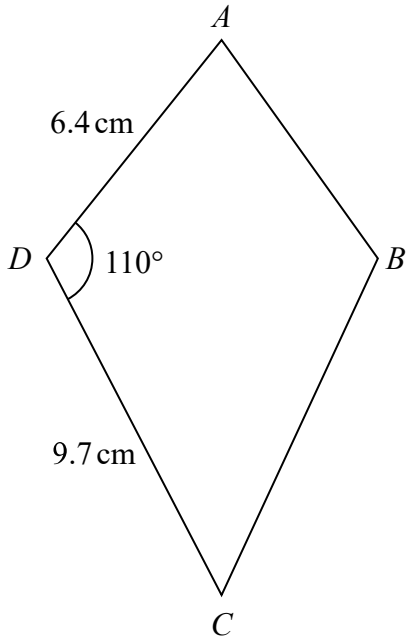


Diagram **NOT** accurately drawn

Work out the area of the kite.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 18 is 3 marks)

19 A car travels a distance of 63.5 km, correct to the nearest 0.5 km.
The car takes 45.8 minutes correct to 1 decimal place.

Work out the lower bound for the average speed of the car.
Show your working clearly.
Give your answer in km/h correct to 1 decimal place.

..... km/h

(Total for Question 19 is 4 marks)

20 Prove algebraically that the difference between the squares of any two consecutive odd numbers is always a multiple of 8.

(Total for Question 20 is 4 marks)

21 *LMNP* is a quadrilateral.

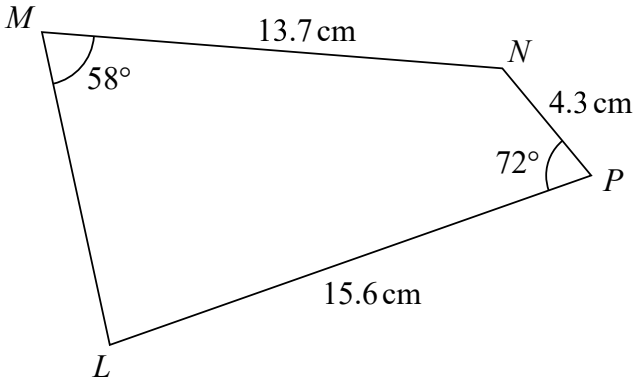


Diagram **NOT** accurately drawn

Work out the size of angle *MLP*.
Give your answer correct to 3 significant figures.

..... °

(Total for Question 21 is 6 marks)

22 Show that $\frac{\sqrt{12}-1}{2-\sqrt{3}}$ can be written as $4 + 3\sqrt{3}$

Show your working clearly.

(Total for Question 22 is 4 marks)

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23 The diagram shows a solid hemisphere.

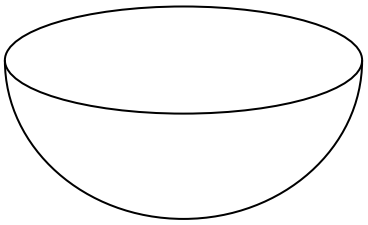


Diagram **NOT** accurately drawn

The hemisphere has a **total** surface area of $\frac{16}{3}\pi$ cm^2

The hemisphere has a volume of $k\pi$ cm^3

Find the value of k.

.....

(Total for Question 23 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS