Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Time 1 hour 30 minutes

Paper reference **1MA1/1H**

△ ▲

Mathematics

PAPER 1 (Non-Calculator)

Higher Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, Formulae Sheet (enclosed). 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.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may not be used**.

Information

- The total mark for this paper is 80
- 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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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B:1/1/1/1/

P 6 8 7 2 1 A 0 1 2 8

Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 500 as a product of powers of its prime factors.

.....

(Total for Question 1 is 3 marks)

2 (a) Work out $1\frac{3}{5} + 2\frac{1}{4}$

Give your answer as a mixed number.

.....

(2)

(b) Show that $2\frac{2}{3} \div 6 = \frac{4}{9}$

(2)

(Total for Question 2 is 4 marks)

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3 Simplify $(2^{-5} \times 2^{8})^{2}$

Give your answer as a power of 2

.....

(Total for Question 3 is 2 marks)

4 Work out 0.004×0.32

.....

(Total for Question 4 is 2 marks)

5 A car factory is going to make four different car models **A**, **B**, **C** and **D**.

80 people are asked which of the four models they would be most likely to buy.

The table shows information about the results.

Car model	Number of people
A	23
B	15
C	30
D	12

The factory is going to make 40 000 cars next year.

Work out how many model **B** cars the factory should make next year.

.....

(Total for Question 5 is 2 marks)

6 Rizwan writes down three numbers a, b and c

$$a : b = 1 : 3$$
$$b : c = 6 : 5$$

(a) (i) Find $a : b : c$

.....

(2)

(ii) Express a as a fraction of the total of the three numbers a, b and c

.....

(2)

Emma writes down three numbers m, n and p

$$n = 2m$$
$$p = 5n$$

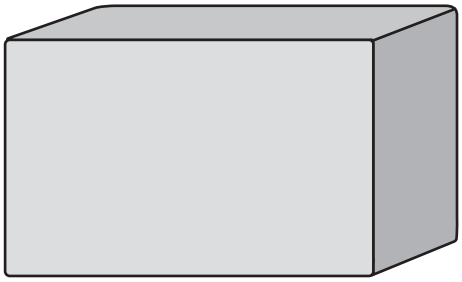
(b) Find $m : p$

.....

(2)

(Total for Question 6 is 6 marks)

7



$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

A storage tank exerts a force of 10 000 newtons on the ground.

The base of the tank in contact with the ground is a 4 m by 2 m rectangle.

Work out the pressure on the ground due to the tank.

..... newtons / m^2

(Total for Question 7 is 2 marks)

8 Two numbers m and n are such that

m is a multiple of 5

n is an even number

the highest common factor (HCF) of m and n is 7

Write down a possible value for m and a possible value for n.

$m =$ .....

$n =$ .....

(Total for Question 8 is 2 marks)

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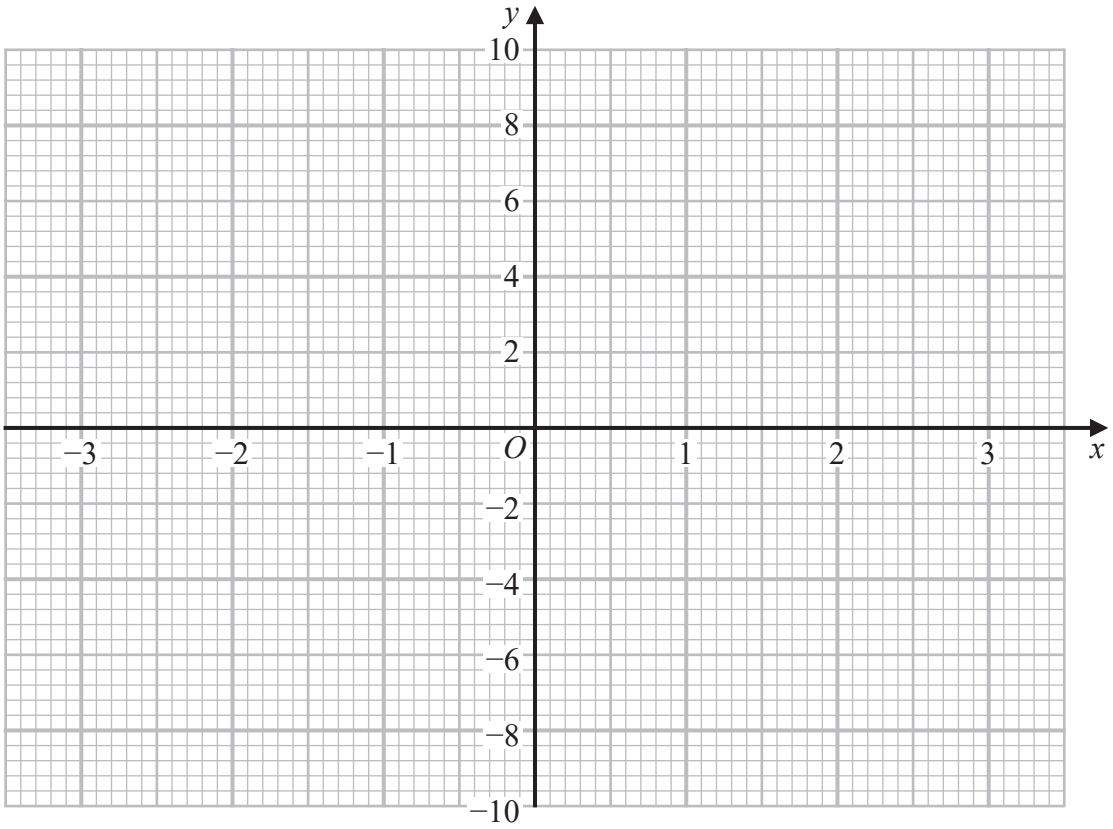
9 (a) Complete the table of values for $y = 6x - x^3$

x	−3	−2	−1	0	1	2	3
y	9					4	−9

(2)

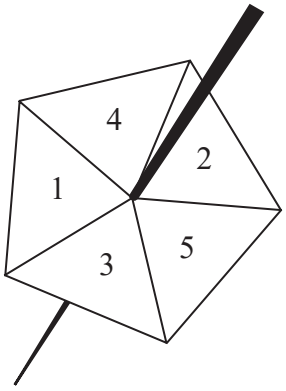
(b) On the grid, draw the graph of $y = 6x - x^3$ for values of x from −3 to 3



(2)

(Total for Question 9 is 4 marks)

10 Lina spins a biased 5-sided spinner 40 times.



Here are her results.

Score	1	2	3	4	5
Frequency	6	8	9	7	10

Lina is now going to spin the spinner another two times.

(a) Work out an estimate for the probability that she gets a score of 5 both times.

.....

(2)

Derek is going to spin the spinner a large number of times.

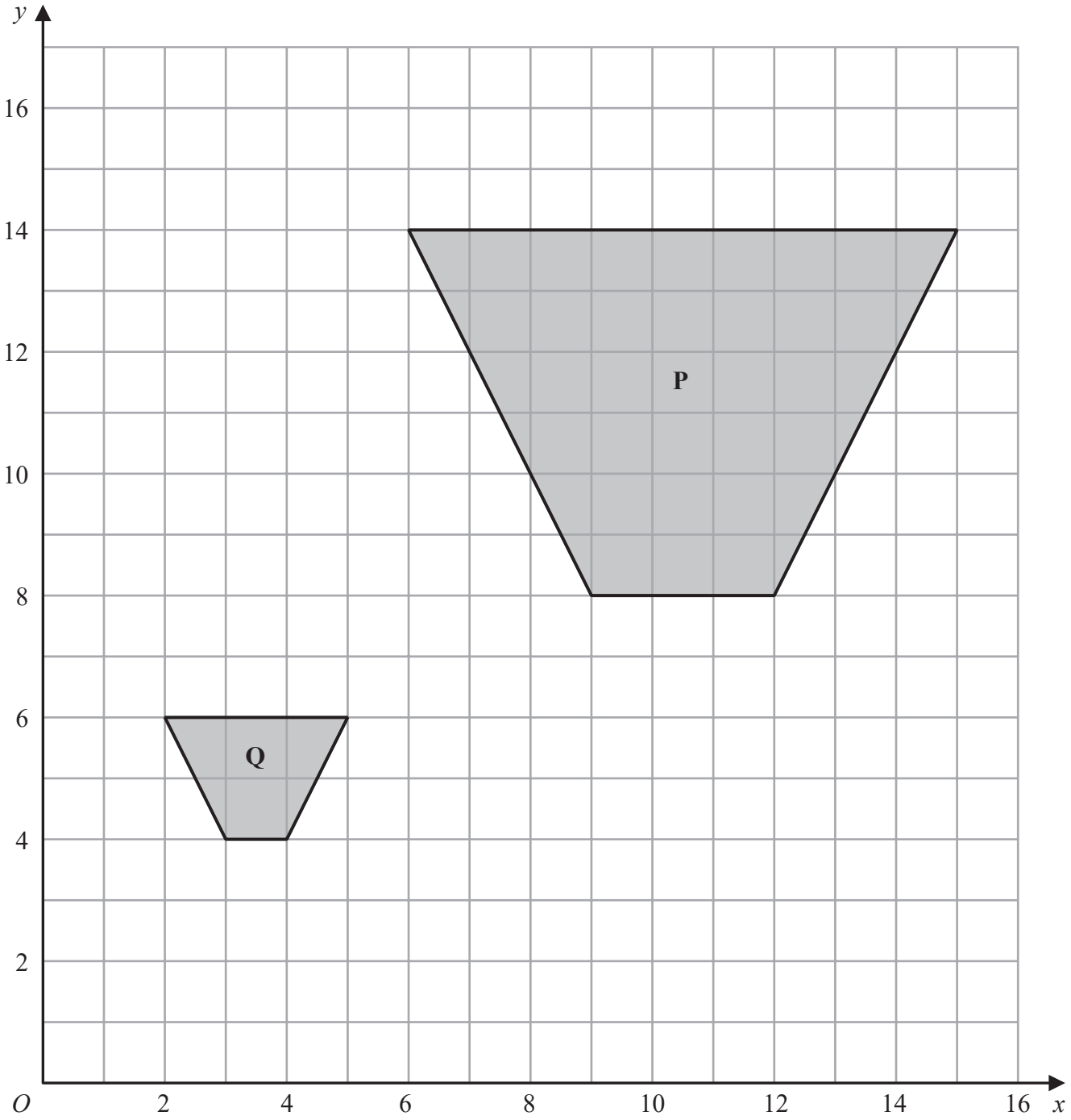
(b) Work out an estimate for the percentage of times Derek can expect to get a score of 1

.....%

(2)

(Total for Question 10 is 4 marks)

11



Describe fully the single transformation that maps shape **P** onto shape **Q**.

.....

.....

.....

(Total for Question 11 is 2 marks)

12 Solve the simultaneous equations

$$5x + 2y = 11$$
$$4x + 3y = 6$$

$x =$ .....

$y =$ .....

(Total for Question 12 is 4 marks)

13 p is inversely proportional to t

Complete the table of values.

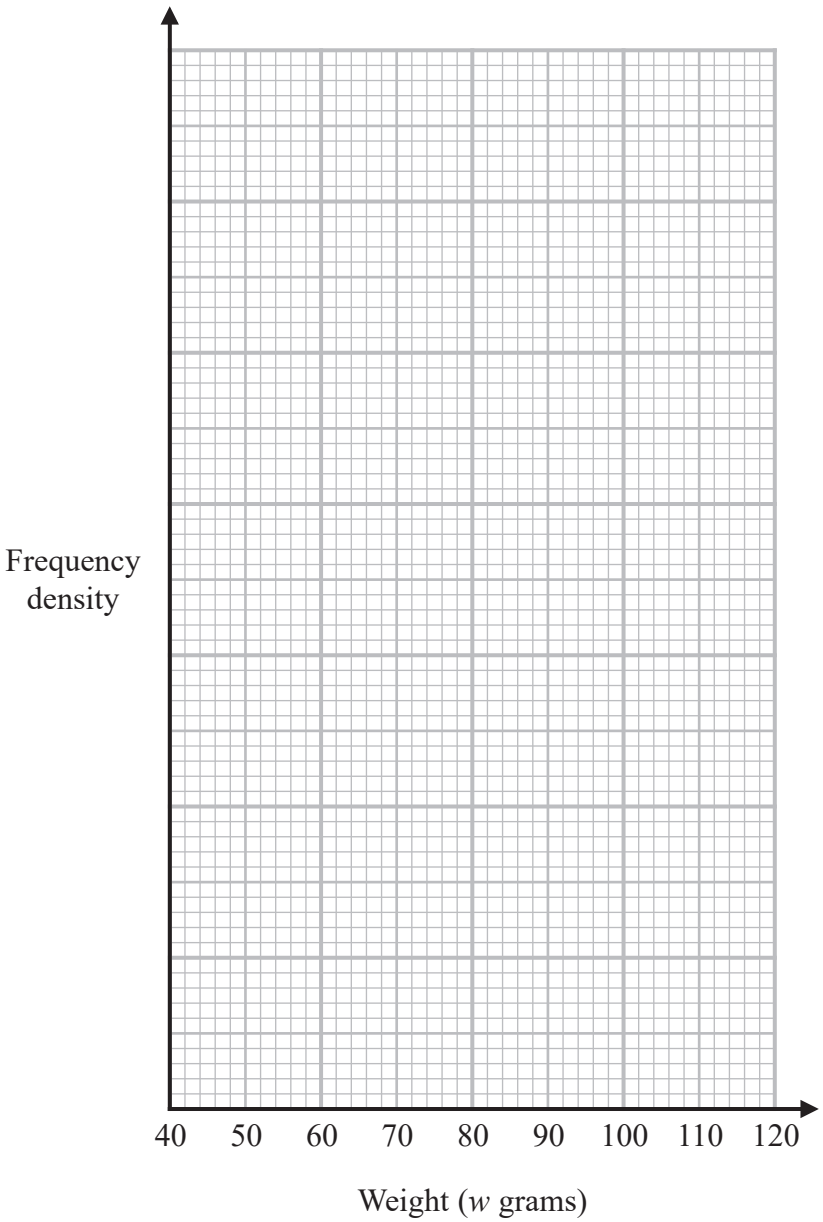
t	100	25		2
p	1		5	

(Total for Question 13 is 3 marks)

14 The table shows information about the weights, in grams, of some potatoes.

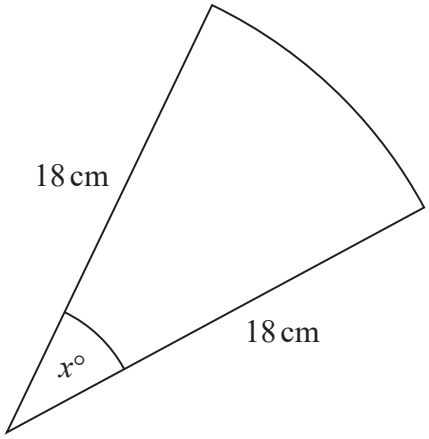
Weight (w grams)	Number of potatoes
$50 < w \leqslant 70$	20
$70 < w \leqslant 80$	50
$80 < w \leqslant 90$	60
$90 < w \leqslant 110$	30

On the grid, draw a histogram for this information.



(Total for Question 14 is 3 marks)

15 The diagram shows a sector of a circle of radius 18 cm.



The length of the arc is 4π cm.

Work out the value of x.

$x =$ .....

(Total for Question 15 is 3 marks)

16 (a) Prove that

$$(2m + 1)^2 - (2n - 1)^2 = 4(m + n)(m - n + 1)$$

(3)

Sophia says that the result in part (a) shows that the difference of the squares of any two odd numbers must be a multiple of 4

(b) Is Sophia correct?
You must give reasons for your answer.

.....

.....

.....

(1)

(Total for Question 16 is 4 marks)

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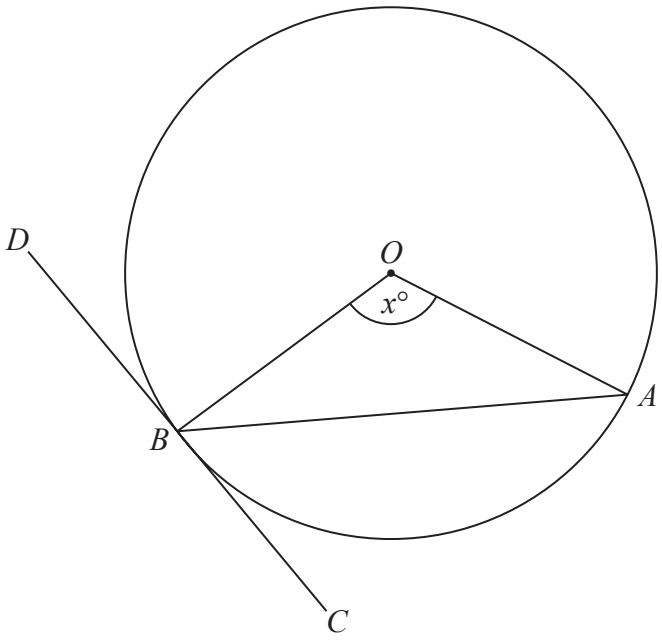
17 Work out the value of $\left(\frac{8}{27}\right)^{\frac{4}{3}}$

.....

(Total for Question 17 is 2 marks)

18



A and *B* are points on a circle, centre *O*.
DBC is the tangent to the circle at *B*.
Angle *AOB* = $x°$

Show that angle *ABC* = $\frac{1}{2}x°$

You must give a reason for each stage of your working.

(Total for Question 18 is 3 marks)

19 Solve $\frac{1}{x} - \frac{1}{x+1} = 4$

Give your answer in the form $a \pm b\sqrt{2}$ where a and b are fractions.

.....

(Total for Question 19 is 5 marks)

20 Alfie has 11 cards.

He has

3 blue cards
7 green cards
and 1 white card.

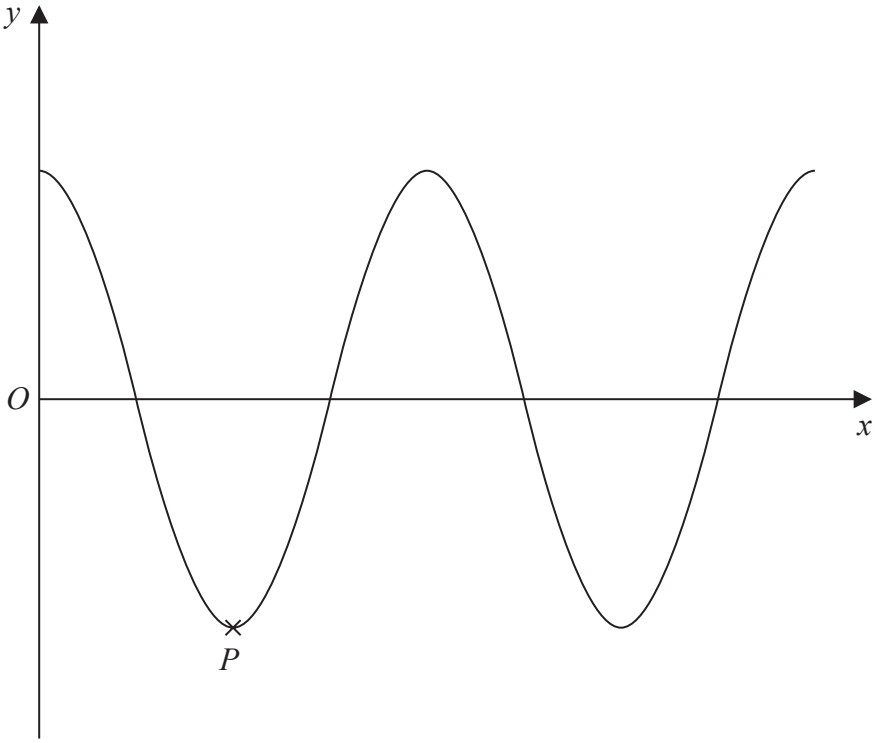
Alfie takes at random 2 of these cards.

Work out the probability that he takes cards of different colours.

.....

(Total for Question 20 is 3 marks)

21



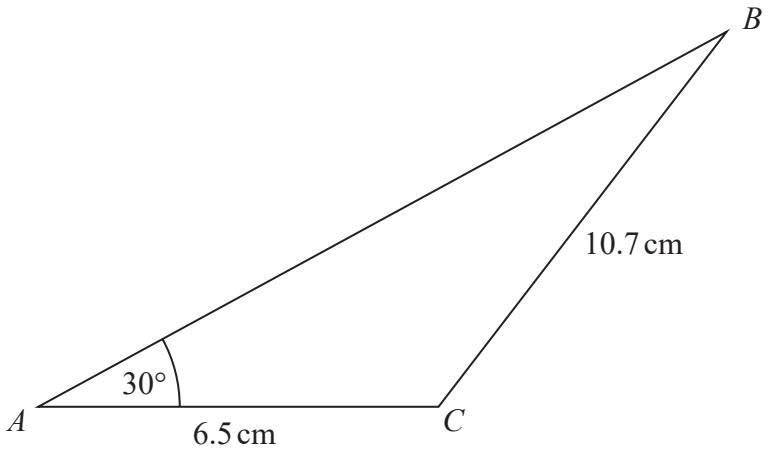
The diagram shows a sketch of part of the curve with equation $y = \cos x°$
P is a minimum point on the curve.

Write down the coordinates of P.

(..... , ...)

(Total for Question 21 is 2 marks)

22 Here is a triangle ABC.



Work out the value of $\sin ABC$

Give your answer in the form $\frac{m}{n}$ where m and n are integers.

.....

(Total for Question 22 is 4 marks)

23 Here are the first five terms of a geometric sequence.

$$\sqrt{5} \qquad 10 \qquad 20\sqrt{5} \qquad 200 \qquad 400\sqrt{5}$$

(a) Work out the next term of the sequence.

.....

(2)

The 4th term of a different geometric sequence is $\frac{5\sqrt{2}}{4}$

The 6th term of this sequence is $\frac{5\sqrt{2}}{8}$

Given that the terms of this sequence are all positive,

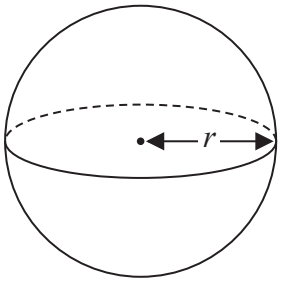
(b) work out the first term of this sequence.
You must show all your working.

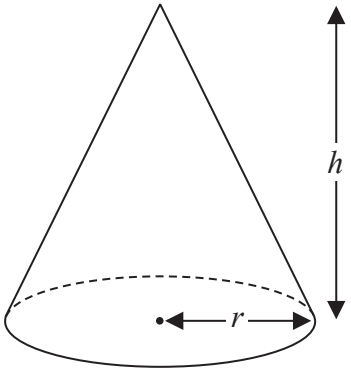
.....

(3)

(Total for Question 23 is 5 marks)

24 Here is a solid sphere and a solid cone.





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

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

All measurements are in cm.

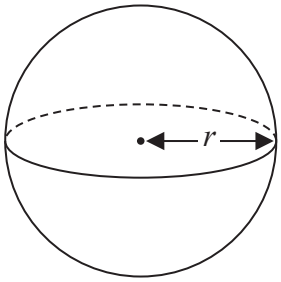
The volume of the sphere is equal to the volume of the cone.

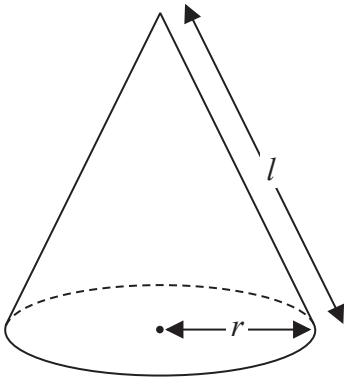
(a) Find $r : h$
Give your answer in its simplest form.

.....

(2)

Here is a different solid sphere and a different solid cone.





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

Curved area of cone = $\pi r l$

All measurements are in cm.

The surface area of the sphere is equal to the **total** surface area of the cone.

(b) Find $r : h$

Give your answer in the form $1 : \sqrt{n}$ where n is an integer.

.....

(4)

(Total for Question 24 is 6 marks)

TOTAL FOR PAPER IS 80 MARKS

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