

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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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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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)



P 6 8 7 2 1 A 0 3 2 8

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)



P 6 8 7 2 1 A 0 5 2 8

- 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

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

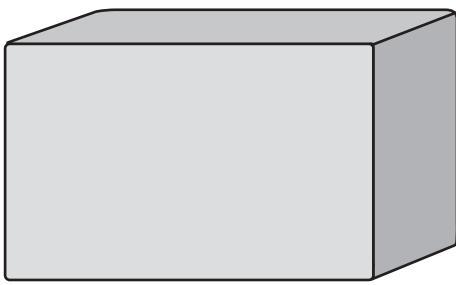
(b) Find $m:p$

.....
(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 / m²

(Total for Question 7 is 2 marks)



P 6 8 7 2 1 A 0 7 2 8

- 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 .

$m = \dots$

$n = \dots$

(Total for Question 8 is 2 marks)

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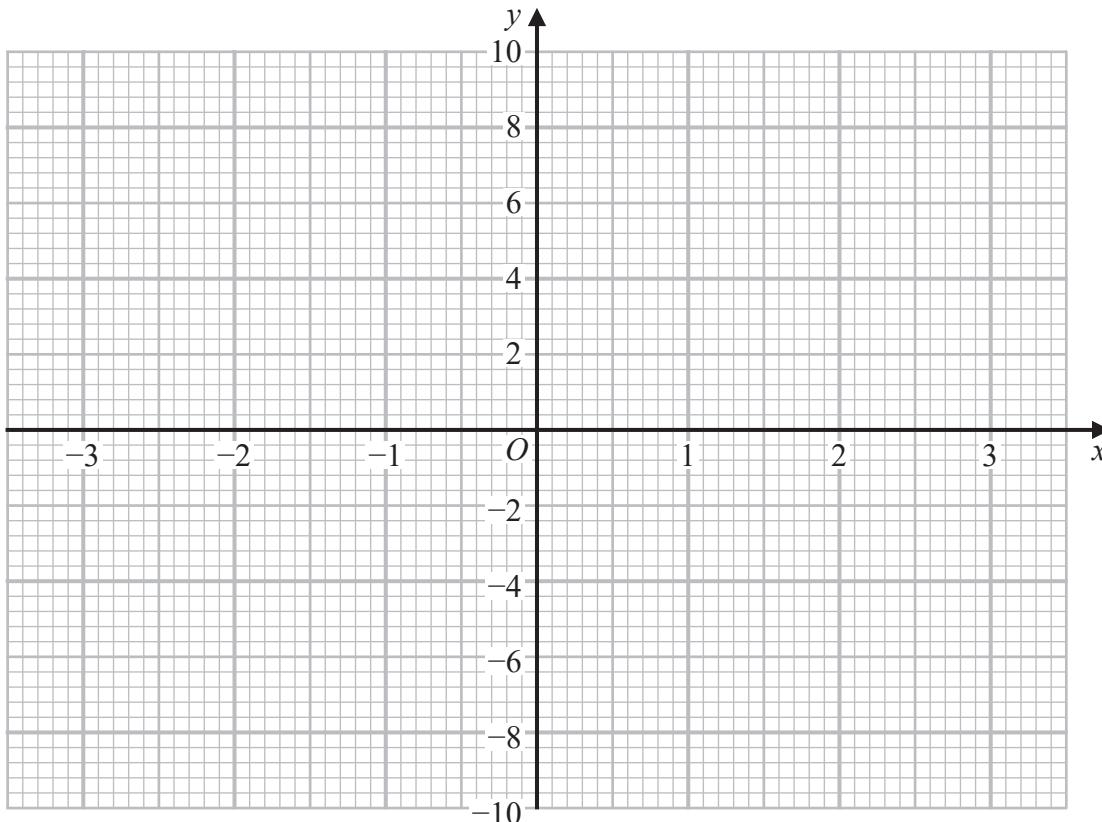


- 9 (a) Complete the table of values for $y = 6x - x^3$

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



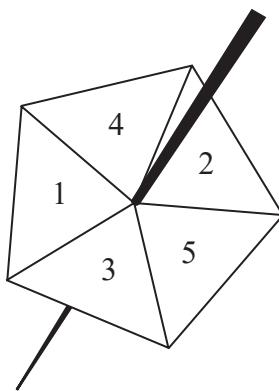
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(Total for Question 9 is 4 marks)



P 6 8 7 2 1 A 0 9 2 8

- 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

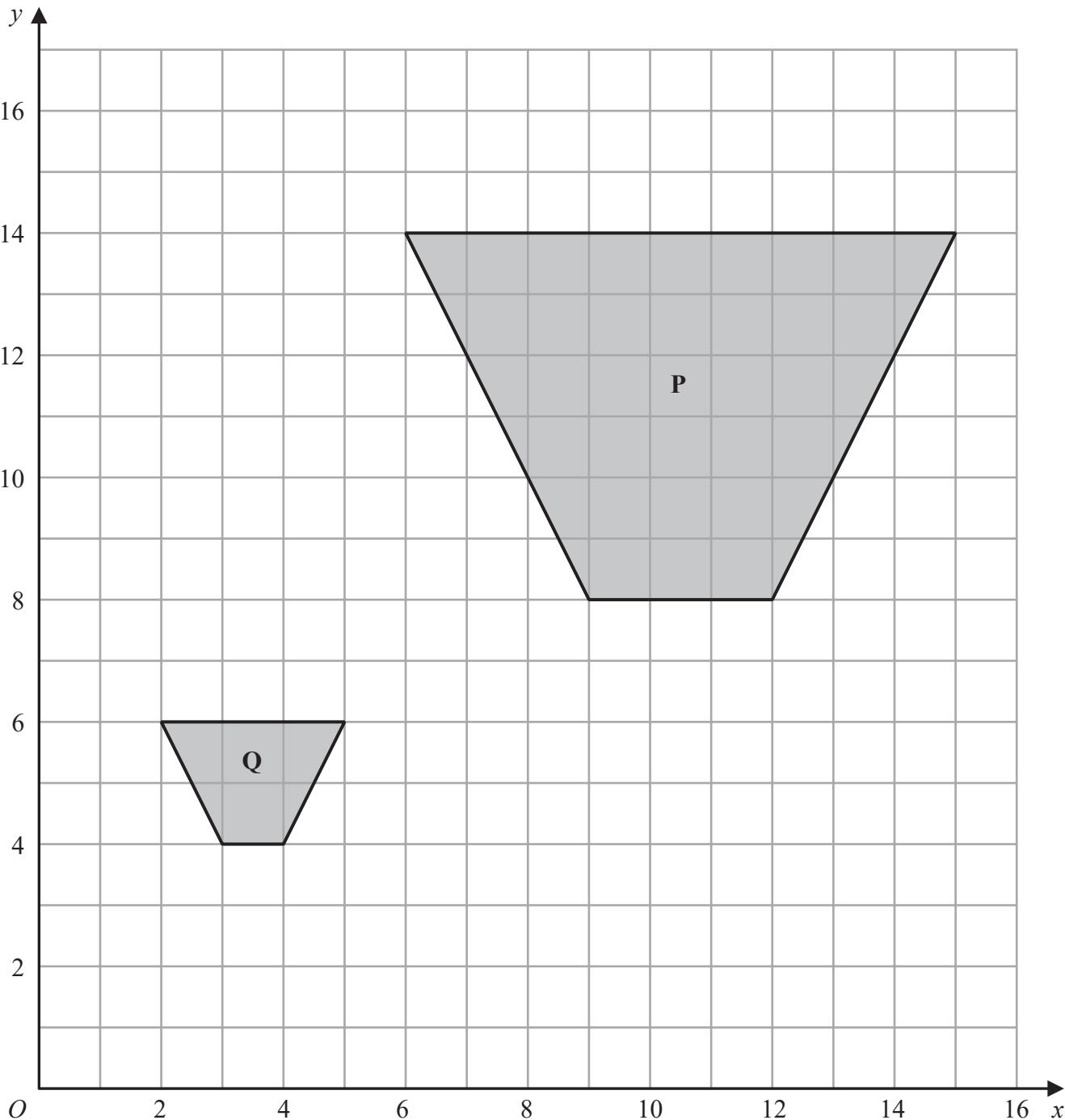
%

.....
(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

$$\begin{aligned}5x + 2y &= 11 \\4x + 3y &= 6\end{aligned}$$

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	

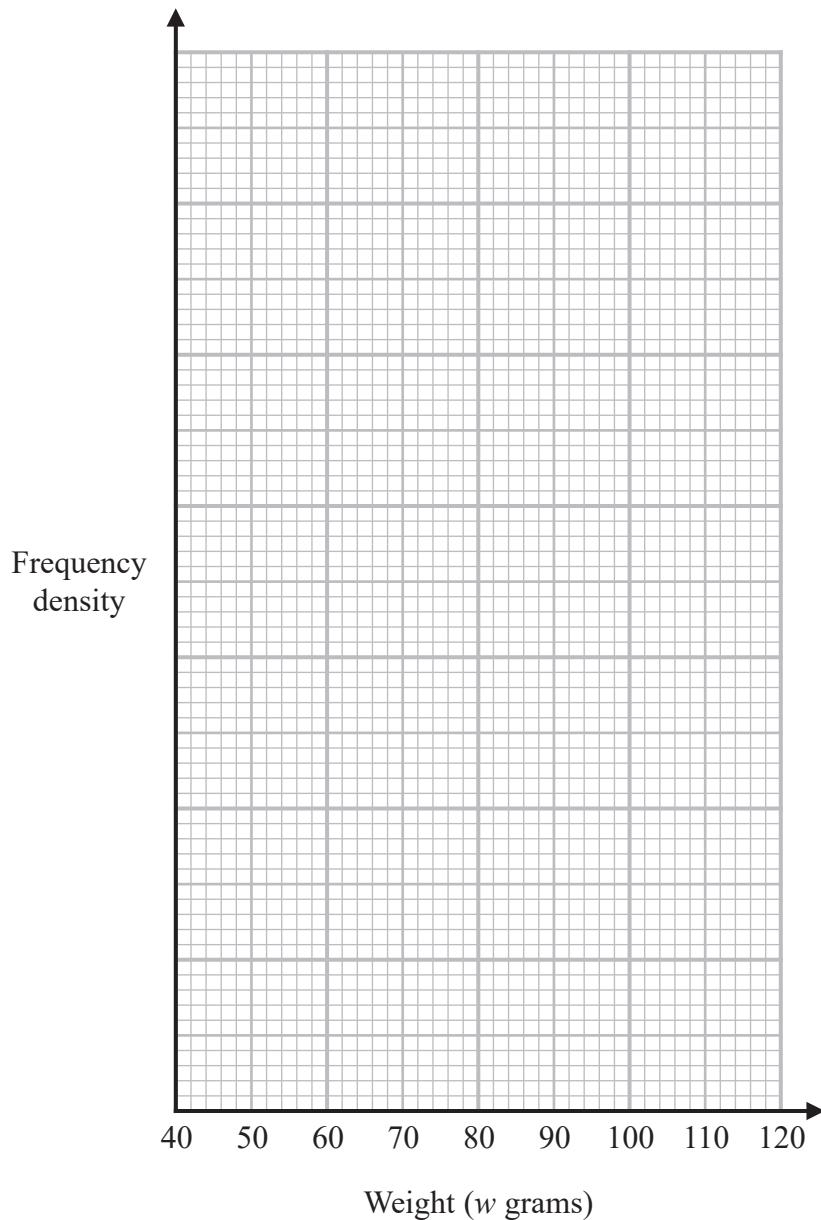
(Total for Question 13 is 3 marks)



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

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

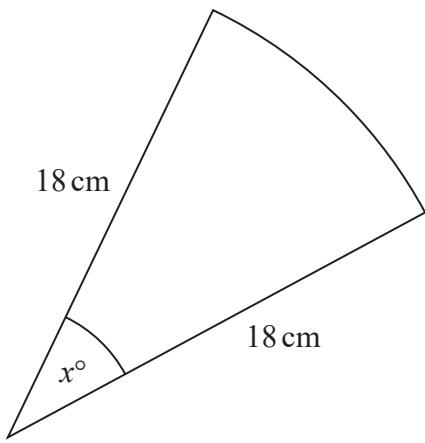
On the grid, draw a histogram for this information.



(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 .

$$x = \dots$$

(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)



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

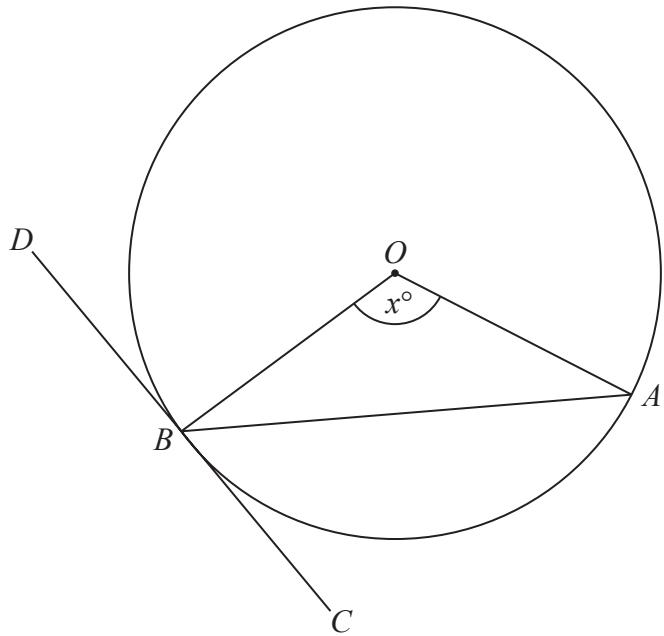
.....
.....

(Total for Question 17 is 2 marks)



P 6 8 7 2 1 A 0 1 7 2 8

18



A and *B* are points on a circle, centre *O*.

DBC is the tangent to the circle at *B*.

Angle $AOB = x^\circ$

Show that angle $ABC = \frac{1}{2}x^\circ$

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)



P 6 8 7 2 1 A 0 1 9 2 8

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.

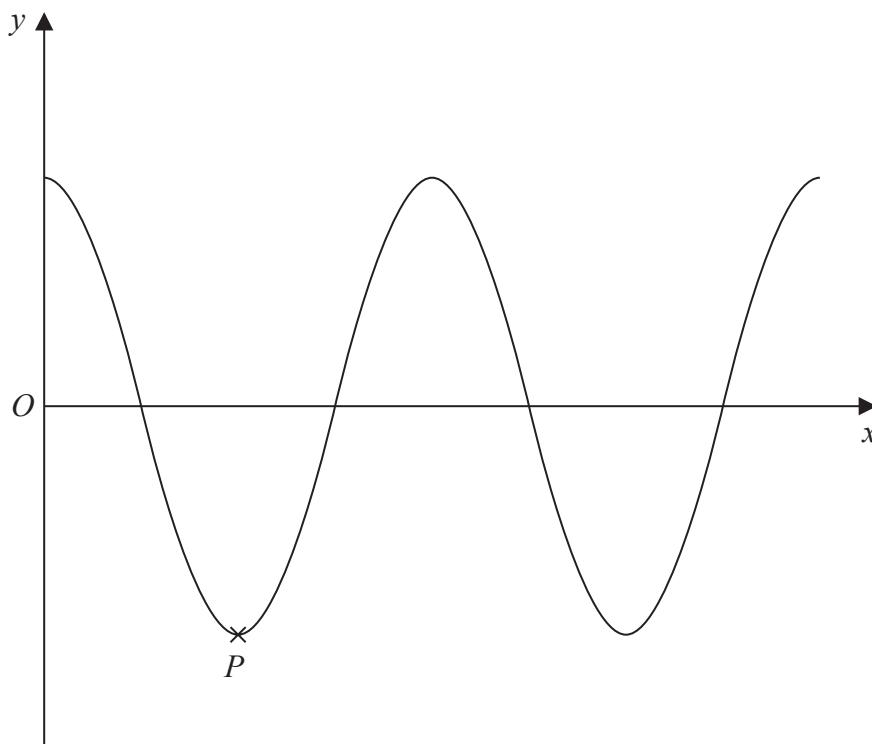
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(Total for Question 20 is 3 marks)



21

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

Write down the coordinates of P .

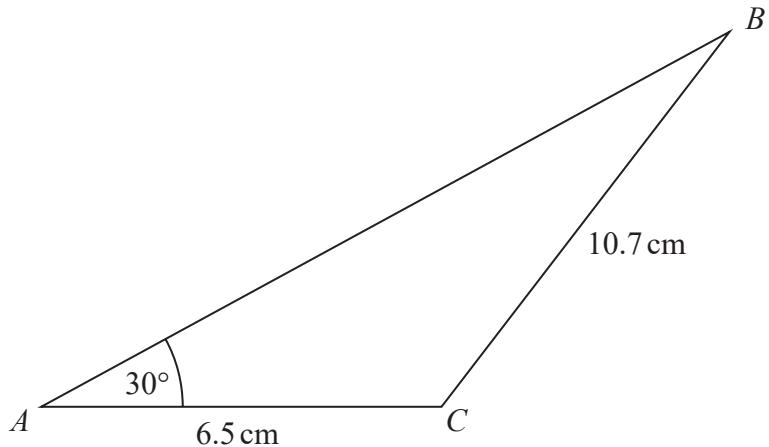
(..... ,)

(Total for Question 21 is 2 marks)



P 6 8 7 2 1 A 0 2 1 2 8

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.

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

- (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.

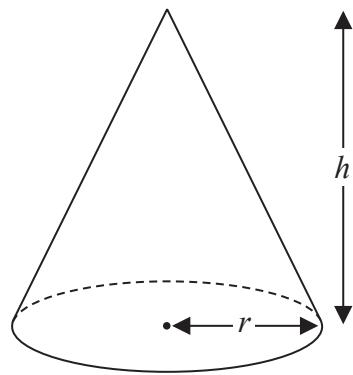
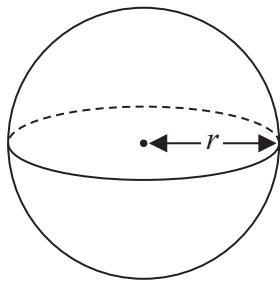
.....
(3)

(Total for Question 23 is 5 marks)



P 6 8 7 2 1 A 0 2 3 2 8

24 Here is a solid sphere and a solid cone.



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

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

All measurements are in cm.

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

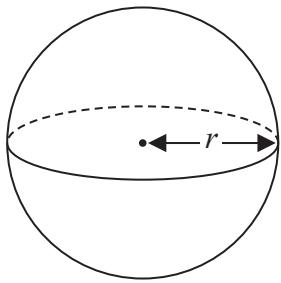
(a) Find $r:h$

Give your answer in its simplest form.

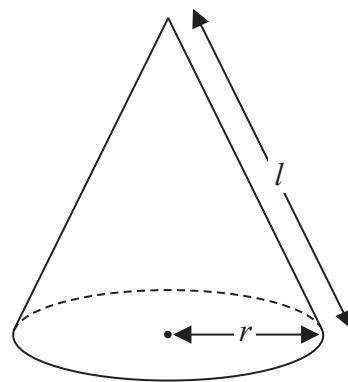
(2)



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



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



$$\text{Curved area of cone} = \pi r l$$

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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