

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.  
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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Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Work out  $3.67 \times 4.2$

.....  
(3)

(b) Work out  $59.84 \div 1.6$

.....  
(3)

(Total for Question 1 is 6 marks)

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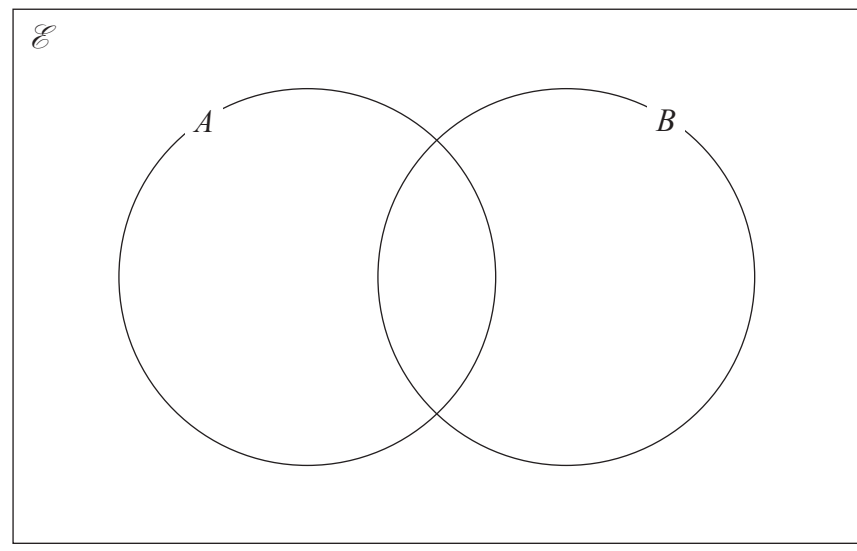
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- 2  $\mathcal{E} = \{\text{even numbers less than } 19\}$   
 $A = \{6, 12, 18\}$   
 $B = \{2, 6, 14, 18\}$

Complete the Venn diagram for this information.



(Total for Question 2 is 3 marks)

- 3 Work out  $4\frac{1}{5} - 2\frac{2}{3}$

Give your answer as a mixed number.

(Total for Question 3 is 3 marks)



- 4 At the end of 2017  
the value of Tamara's house was £220 000  
the value of Rahim's house was £160 000

At the end of 2019  
the value of Tamara's house had decreased by 20%  
the value of Rahim's house had increased by 30%

At the end of 2019, whose house had the greater value?  
You must show how you get your answer.

(Total for Question 4 is 4 marks)

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5 Rosie, Matilda and Ibrahim collect stickers.

$$\begin{array}{l} \text{number of stickers} \\ \text{Rosie has} \end{array} : \begin{array}{l} \text{number of stickers} \\ \text{Matilda has} \end{array} : \begin{array}{l} \text{number of stickers} \\ \text{Ibrahim has} \end{array} = 4:7:15$$

Ibrahim has 24 more stickers than Matilda.

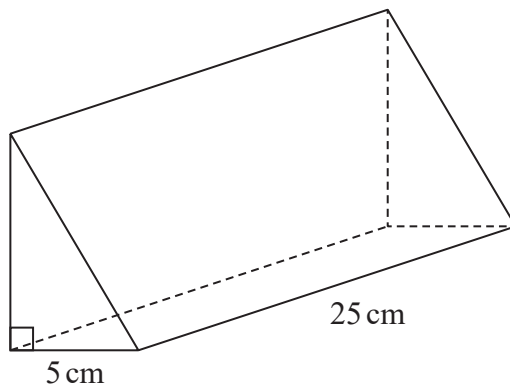
Ibrahim has more stickers than Rosie.

How many more?

.....  
(Total for Question 5 is 3 marks)



6 The diagram shows a prism.



The cross section of the prism is a right-angled triangle.  
The base of the triangle has length 5 cm

The prism has length 25 cm  
The prism has volume  $750 \text{ cm}^3$

Work out the height of the prism.

..... cm

(Total for Question 6 is 3 marks)

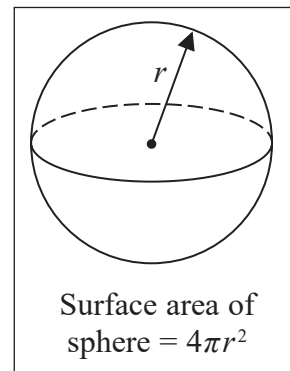
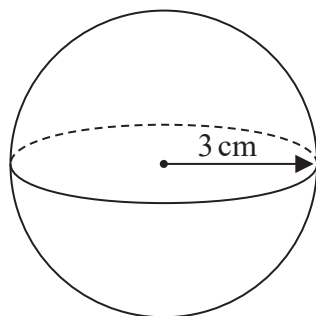
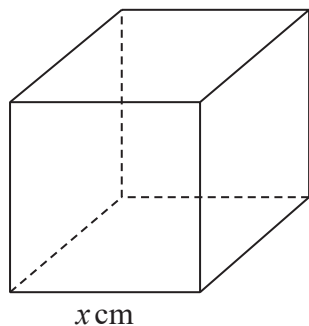
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- 7 The diagram shows a cube with edges of length  $x$  cm and a sphere of radius 3 cm.



The surface area of the cube is equal to the surface area of the sphere.

Show that  $x = \sqrt{k\pi}$  where  $k$  is an integer.

(Total for Question 7 is 4 marks)



8 Solve  $x^2 = 5x + 24$

.....  
(Total for Question 8 is 3 marks)

9 (a) Write down the value of  $7^0$

.....  
(1)

(b) Find the value of  $3 \times 3^6 \times 3^{-6}$

.....  
(1)

(c) Find the value of  $2^{-4}$

.....  
(1)

(d) Find the value of  $27^{\frac{1}{3}}$

.....  
(1)

(Total for Question 9 is 4 marks)



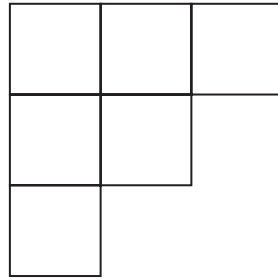


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10 The diagram shows a shape made from 6 identical squares.



The total area of the shape is  $5406 \text{ cm}^2$

- (a) Find an estimate for the length of one side of each square.  
Give your answer correct to the nearest whole number.

..... cm  
(3)

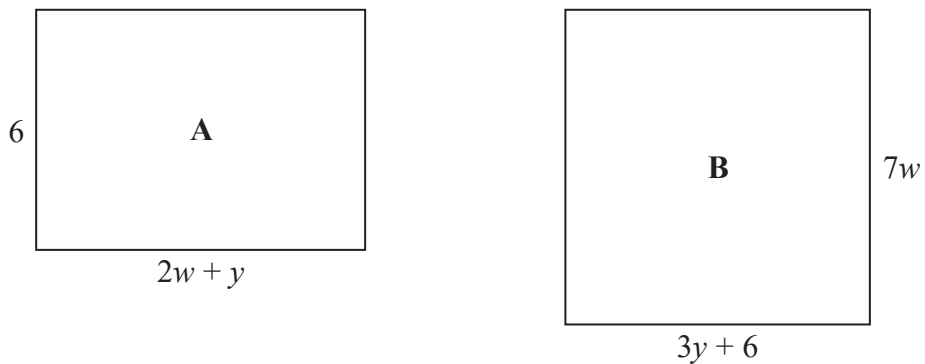
- (b) Is your answer to part (a) an underestimate or an overestimate?  
You must give a reason for your answer.

.....  
 .....  
 ..... (1)

(Total for Question 10 is 4 marks)



11 The diagram shows two rectangles, **A** and **B**.



All measurements are in centimetres.

The area of rectangle **A** is equal to the area of rectangle **B**.

Find an expression for  $y$  in terms of  $w$ .

.....  
(Total for Question 11 is 4 marks)

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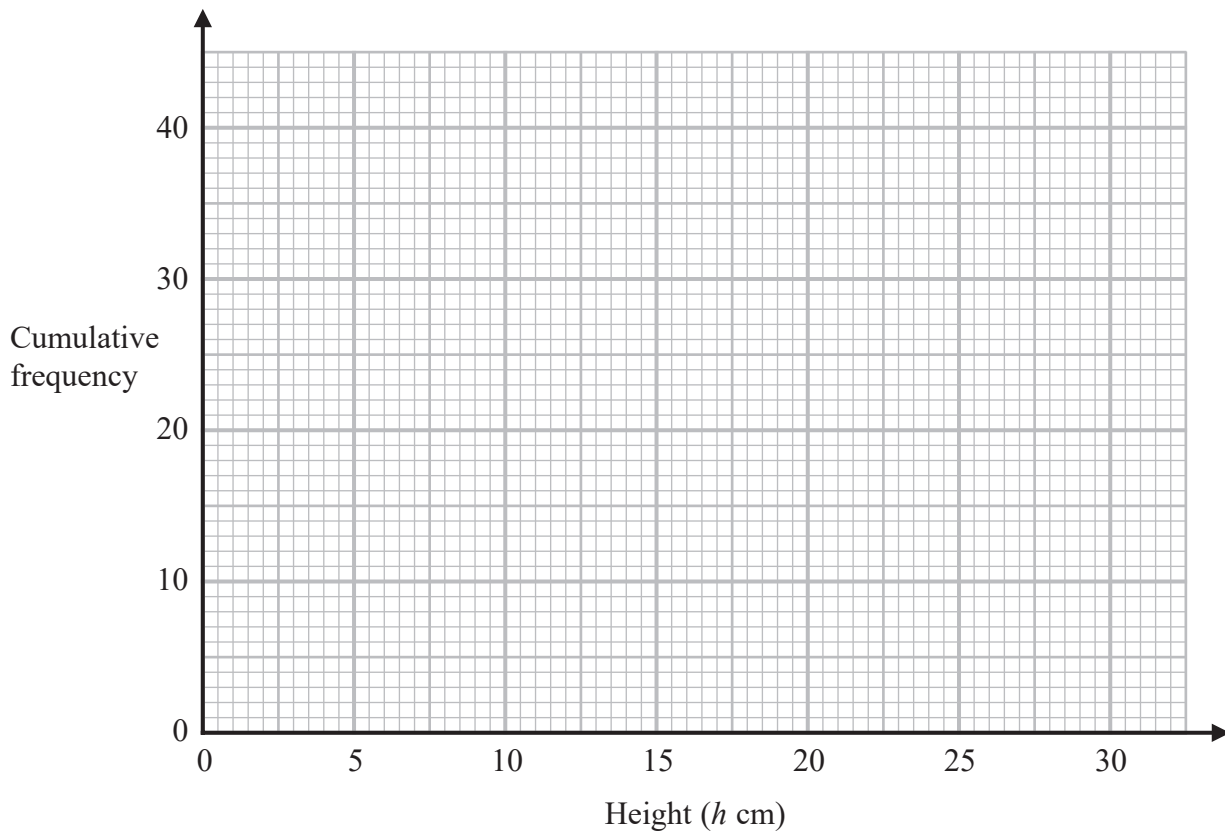
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12 The cumulative frequency table gives information about the heights, in cm, of 40 plants.

Height ( $h$ cm)	Cumulative Frequency
$0 < h \leq 5$	4
$0 < h \leq 10$	11
$0 < h \leq 15$	24
$0 < h \leq 20$	34
$0 < h \leq 25$	38
$0 < h \leq 30$	40

(a) On the grid, draw a cumulative frequency graph for this information.



(2)

(b) Use the graph to find an estimate for the median height of the plants.

..... cm

(1)

(Total for Question 12 is 3 marks)



P 6 4 6 3 0 A 0 1 1 2 4

13 Ted is trying to change  $0.\dot{4}\dot{3}$  to a fraction.

Here is the start of his method.

$$x = 0.\dot{4}\dot{3}$$

$$10x = 4.\dot{3}\dot{4}$$

$$10x - x = 4.\dot{3}\dot{4} - 0.\dot{4}\dot{3}$$

Evaluate Ted's method so far.

.....

.....

.....

(Total for Question 13 is 1 mark)

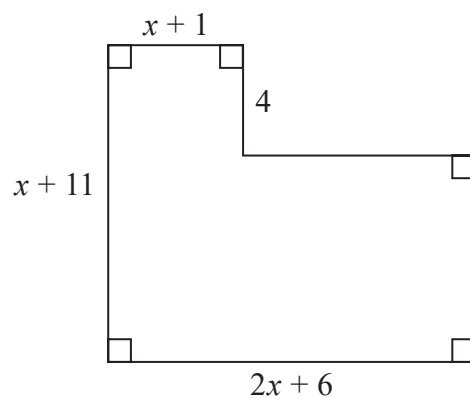
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14 Here is a shape with all its measurements in centimetres.



The area of the shape is  $A \text{ cm}^2$

Show that  $A = 2x^2 + 24x + 46$

(Total for Question 14 is 3 marks)



15 Show that  $\frac{4x+3}{2x} + \frac{3}{5}$  can be written in the form  $\frac{ax+b}{cx}$  where  $a$ ,  $b$  and  $c$  are integers.

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(Total for Question 15 is 3 marks)



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16 There are only 3 red counters and 5 yellow counters in a bag.

Jude takes at random 3 counters from the bag.

Work out the probability that he takes exactly one red counter.

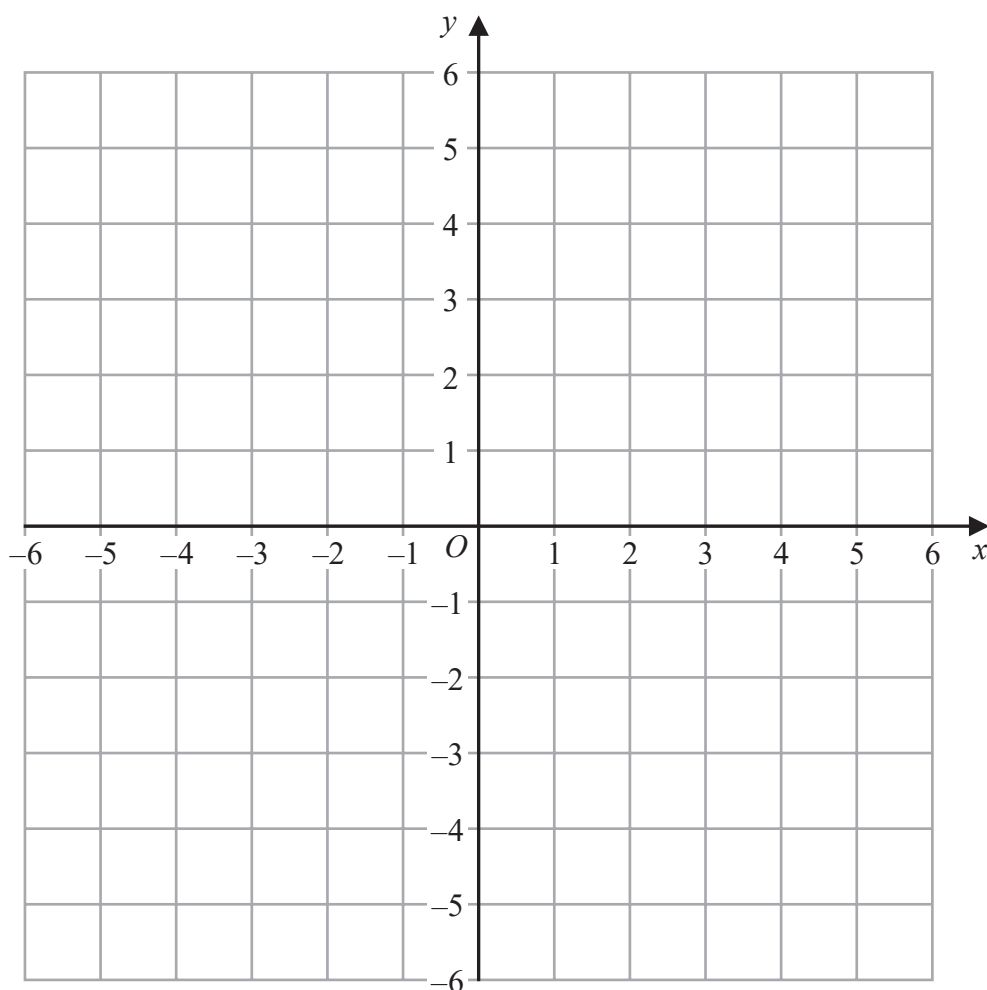
.....  
(Total for Question 16 is 4 marks)



17 On the grid show, by shading, the region that satisfies all of these inequalities.

$$2y + 4 < x \quad x < 3 \quad y < 6 - 3x$$

Label the region **R**.



(Total for Question 17 is 3 marks)

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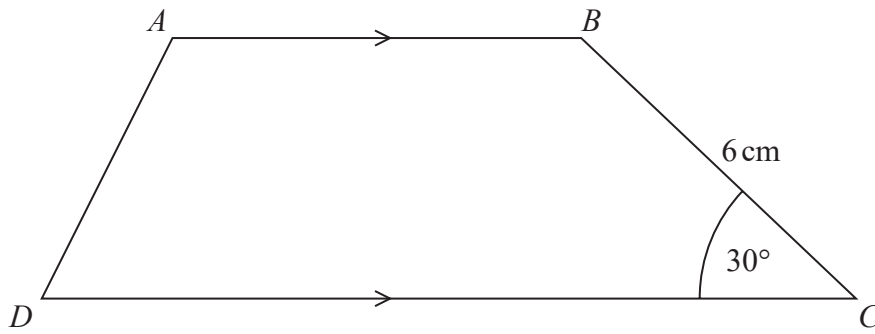


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18 Here is trapezium  $ABCD$ .



The area of the trapezium is  $66\text{ cm}^2$

the length of  $AB$ : the length of  $CD = 2:3$

Find the length of  $AB$ .

..... cm

(Total for Question 18 is 5 marks)



19 Show that  $\frac{8 + \sqrt{12}}{5 + \sqrt{3}}$  can be written in the form  $\frac{a + \sqrt{3}}{b}$ , where  $a$  and  $b$  are integers.

(Total for Question 19 is 4 marks)

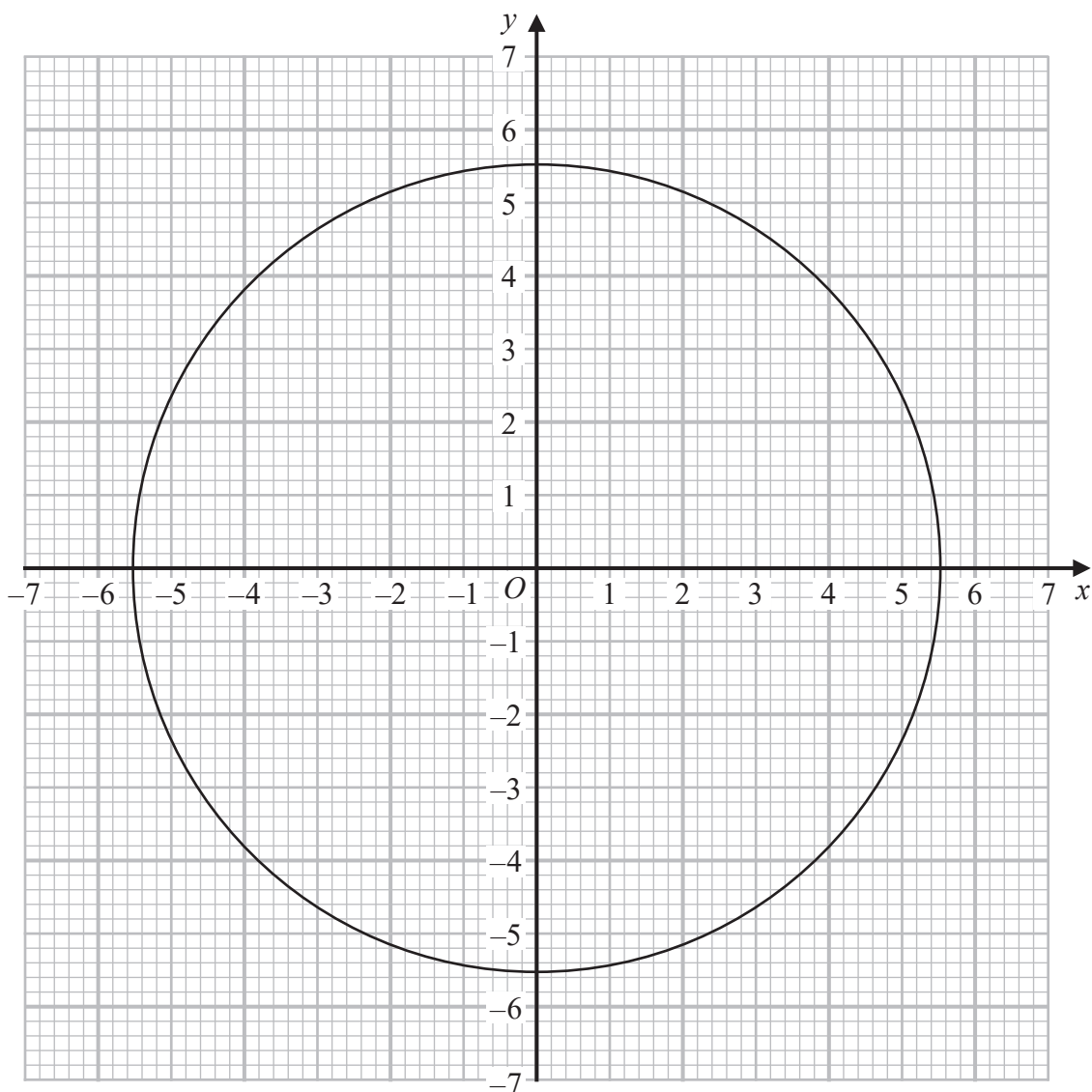
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20 The diagram shows the graph of  $x^2 + y^2 = 30.25$



Use the graph to find estimates for the solutions of the simultaneous equations

$$\begin{aligned}x^2 + y^2 &= 30.25 \\ y - 2x &= 1\end{aligned}$$

(Total for Question 20 is 3 marks)



P 6 4 6 3 0 A 0 1 9 2 4

21 The functions  $f$  and  $g$  are such that

$$f(x) = 3x^2 + 1 \quad \text{for } x > 0 \quad \text{and} \quad g(x) = \frac{4}{x^2} \quad \text{for } x > 0$$

(a) Work out  $gf(1)$

.....  
(2)

The function  $h$  is such that  $h = (fg)^{-1}$

(b) Find  $h(x)$

.....  
(4)

(Total for Question 21 is 6 marks)



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22 Find the coordinates of the turning point on the curve with equation  $y = 9 + 18x - 3x^2$   
You must show all your working.

(....., .....) )

**(Total for Question 22 is 4 marks)**

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**TOTAL FOR PAPER IS 80 MARKS**



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