

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

**1MA1/3F**

### Mathematics PAPER 3 (Calculator) Foundation Tier

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of 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.
- 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 be used.**
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  to be 3.142 unless the question instructs otherwise.



### 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 Write 45% as a decimal.

0.45

(Total for Question 1 is 1 mark)

- 2 Write down two factors of 35

$$\begin{array}{l} 1 \times 35 \\ 5 \times 7 \end{array}$$

1 and 5

(Total for Question 2 is 1 mark)

- 3 What is the time 2 hours 40 minutes after 8.05 am?

$$\begin{array}{l} 8.05 \\ + 2 \text{ hours} \\ 10.05 \\ + 40 \text{ mins} \\ 10.45 \end{array}$$

10.45 am

(Total for Question 3 is 1 mark)

- 4 Work out  $\frac{1}{6}$  of 66

$$\begin{array}{l} 66 \div 6 \\ \text{or} \\ \frac{1}{6} \times 66 \end{array}$$

11

(Total for Question 4 is 1 mark)

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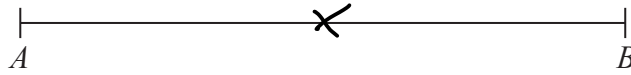
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5  $AB$  is a straight line.

Mark with a cross ( $\times$ ) the midpoint of  $AB$ .



(Total for Question 5 is 1 mark)

6 (a) Simplify  $a \times b \times 4$

$$4ab$$

(1)

(b) Simplify  $4x + 3 - x + 5$

$$3x + 8$$

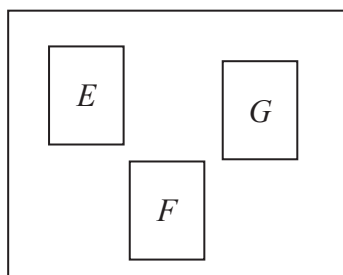
$$3x + 8$$

(2)

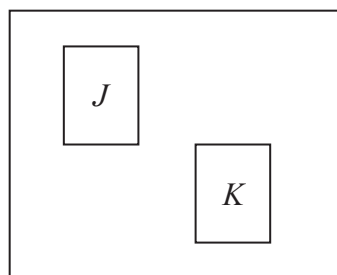
(Total for Question 6 is 3 marks)



- 7 There are three cards in bag A and two cards in bag B.  
There is a letter on each card.



Bag A



Bag B

James takes a card from bag A and then a card from bag B.

List all the possible outcomes.

EJ EK

FJ FK

GJ GK

(Total for Question 7 is 2 marks)

- 8 On Monday, Sandy pays for 2 plane tickets, 7 nights in a hotel and 2 theme park tickets.

	dollars			
each plane ticket	600	$\times 2$	$=$	1200
each night in a hotel	120	$\times 7$	$=$	840
each theme park ticket	250	$\times 2$	$=$	500

Show that Sandy pays more than 2500 dollars on Monday.

$$1200 + 840 + 500 = \underline{\underline{2540}}$$

$$2540 > 2500$$

(Total for Question 8 is 3 marks)



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9 Vadim has 56 clocks.  
The clocks are only red, only blue or only black.

32 of the clocks are plastic.  
5 of the 14 blue clocks are plastic.  
8 of the 12 red clocks are not plastic.

Use this information to complete the two-way table.

	Red	Blue	Black	Total
Plastic	4	5	23	32
Not plastic	8	9	7	24
Total	12	14	30	56

(Total for Question 9 is 3 marks)

10 Corina has £300 to spend on books.  
Each book costs £4.85  
Work out the greatest number of books Corina can buy.

$$300 \div 4.85 = 61.855\dots$$

..... 61

(Total for Question 10 is 3 marks)



11 (a) Write 196 minutes in hours and minutes.

60    120    180    240

$$\underline{3} \times 60 = 180$$

$$196 - 180 = \underline{16}$$

..... 3 ..... hours ..... 16 ..... minutes  
(2)

A train travels  $x$  miles in 2 hours.

(b) Write down an expression, in terms of  $x$ , for the average speed of the train.

.....  $\frac{x}{2}$  ..... miles per hour  
(1)

(Total for Question 11 is 3 marks)

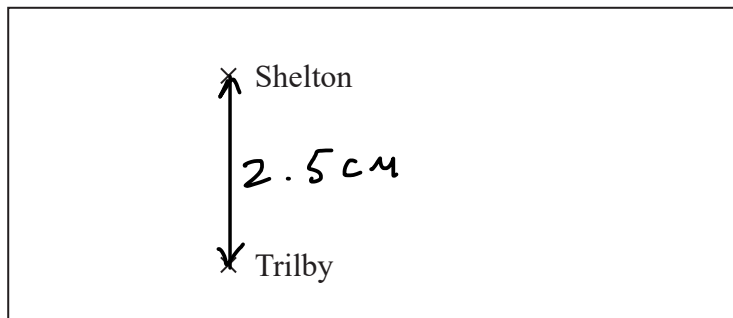
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12 The diagram shows two places on a map.



Scale: 1 centimetre represents 20 kilometres

(a) What is the actual distance, in kilometres, from Shelton to Trilby?

$$2.5 \times 20$$

..... 50 ..... kilometres  
(2)

On a scale drawing, the scale is given as 1 : 1200

(b) How many metres does 5 centimetres represent on this drawing?

$$1 : 1200$$

$$5 : 6000$$

$$6000 \text{ cm} = 60 \text{ m}$$

..... 60 ..... metres  
(2)

(Total for Question 12 is 4 marks)



13 In the Northern hemisphere the ratio of the area of land to the area of water is 2:3

(a) Work out what percentage of the area of the Northern hemisphere is land.

$$\frac{2}{5} \text{ land}$$

$$\frac{2}{5} \times 100 = 40$$

$$\dots\dots\dots 40 \text{ (2)} \dots\dots\dots \%$$

20% of the area of the Southern hemisphere is land.

(b) Work out the ratio of the area of land to the area of water in the Southern hemisphere.

20% land  
80% water

L : W

20 : 80

20 : 80

[or 1:4<sup>(2)</sup>]

(Total for Question 13 is 4 marks)





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14 A stadium cost £600 million.

$\frac{13}{15}$  of this cost was for the building.  
The rest of the cost was for the land.

Work out the cost of the land.

$$\frac{13}{15} \times 600 = \pounds 520 \text{ million (Building)}$$

$$600 - 520 = \pounds 80 \text{ million (Land)}$$

£ 80 million

(Total for Question 14 is 3 marks)

15 Jenna measures all the angles around a point.

Her results are  $23^\circ$ ,  $145^\circ$ ,  $23^\circ$  and  $69^\circ$

Explain why these results cannot be true.

$$23 + 145 + 23 + 69 = 260^\circ$$

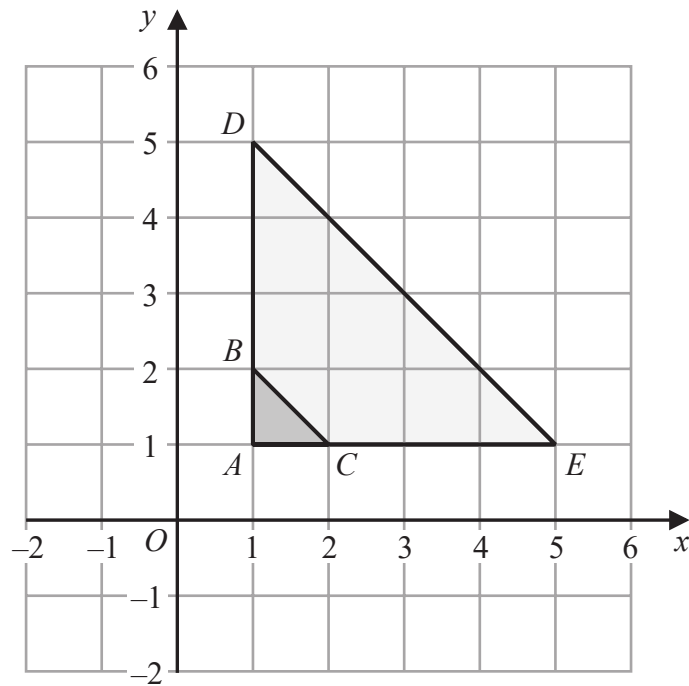
Angles around a point should add to  $360^\circ$

(Total for Question 15 is 1 mark)



P 6 4 6 3 3 A 0 9 2 4

16 Here is a diagram showing triangle  $ABC$  and triangle  $ADE$ .



Describe fully the single transformation that maps triangle  $ABC$  onto triangle  $ADE$ .

Enlargement, Scale Factor 4, Centre (1,1)

(Total for Question 16 is 2 marks)

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17 (a) Expand  $y(y+5)$

$$y^2 + 5y$$

(1)

(b) Factorise  $4a - 6$

$$2(2a - 3)$$

(1)

(c) Solve  $2(5x - 4) = 21$

$$10x - 8 = 21$$

$$10x = 29$$

$$x = 2.9$$

$$x = 2.9$$

(3)

(d) Simplify  $4e^2 \times 5ef^3$

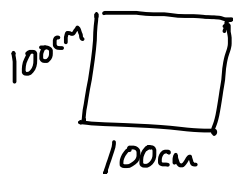
$$4 \times 5 \times e^2 \times e \times f \times f^3$$

$$20e^3f^4$$

(2)

(Total for Question 17 is 7 marks)

18 Change  $1 \text{ m}^2$  into  $\text{cm}^2$



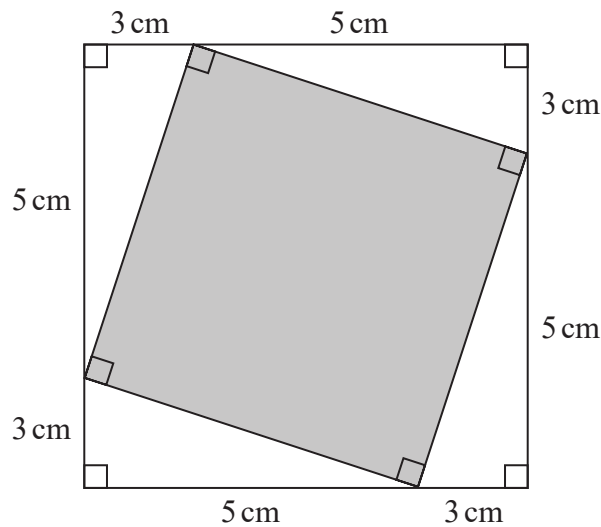
$$100 \times 100 = 10000$$

$$10000 \text{ cm}^2$$

(Total for Question 18 is 1 mark)



19 This diagram shows two squares.



Work out the area of the square shown shaded in the diagram.

$$\text{Area of whole square} = 8 \times 8 = 64 \text{ cm}^2$$

$$\text{Area of triangle} = \frac{1}{2} \times 5 \times 3 = 7.5 \text{ cm}^2$$

$$\text{Area of 4 triangles} = 4 \times 7.5 = 30 \text{ cm}^2$$

$$\text{Area of shaded square} = 64 - 30 = 34 \text{ cm}^2$$

34 cm<sup>2</sup>

(Total for Question 19 is 4 marks)



20 Here are the heights, in centimetres, of 15 plants.

~~15~~ ~~20~~ ~~25~~ ~~33~~ ~~17~~ ~~22~~ ~~25~~ ~~18~~  
~~22~~ ~~19~~ ~~32~~ ~~35~~ ~~24~~ ~~28~~ ~~19~~

Draw a stem and leaf diagram for these heights.

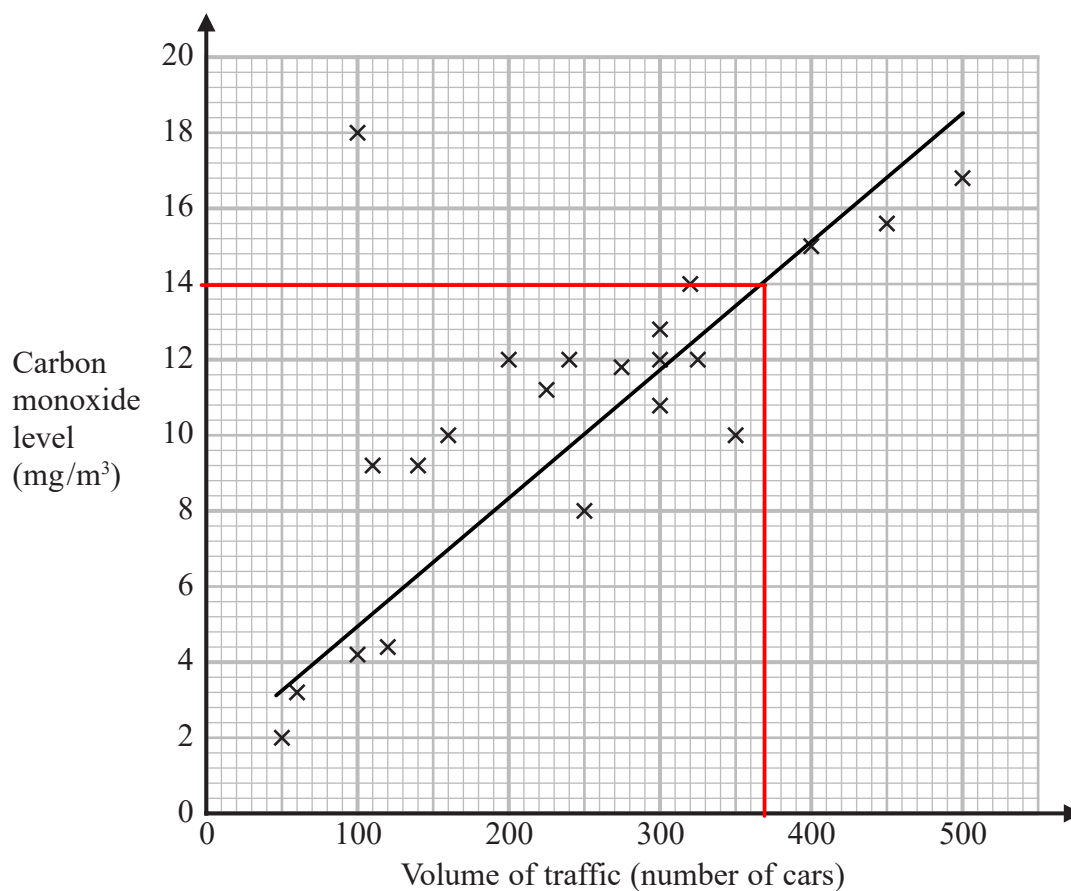
1	5 7 8 9 9
2	0 2 2 4 5 5 8
3	2 3 5

Key:  $1/5 = 15 \text{ cm}$

(Total for Question 20 is 3 marks)



- 21 The scatter graph shows information about the volume of traffic and the carbon monoxide level at a point on a road each day for 22 days.



One point is an outlier.

- (a) Write down the coordinates of this point.

(100, 18)  
(1)

For another day, 370 cars pass the point on the road.

- (b) Estimate the carbon monoxide level for this day.

14 mg/m<sup>3</sup>  
(2)  
12.8 to 14.8



Alfie says,

“Because there is an outlier, there is no correlation.”

(c) Is Alfie correct?

You must give a reason for your answer.

No. There is a positive correlation.  
(We can still draw a line of best fit)

(1)

(Total for Question 21 is 4 marks)

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22 Natalie makes potato cakes in a restaurant.

She mixes potato, cheese and onion so that

$$\text{weight of potato} : \text{weight of cheese} : \text{weight of onion} = 9 : 2 : 1$$

Natalie needs to make 6000 g of potato cakes.

Cheese costs £2.25 for 175 g.

Work out the cost of the cheese needed to make 6000 g of potato cakes.

$$6000 \div 12 = 500 \text{ g (each part)}$$

$$2 \times 500 = 1000 \text{ g (of cheese)}$$

$$\frac{1000}{175} = 5.714 \dots$$

$$6 \times 2.25 = \underline{\underline{13.50}}$$

OR

$$5.714 \times 2.25 = \underline{\underline{12.86}}$$

£ 13.50

(Total for Question 22 is 4 marks)





23 (a) Write  $4.5 \times 10^5$  as an ordinary number.

$$\begin{array}{r} 450000 \\ \hline \end{array}$$

(1)

(b) Write 0.007 in standard form.

$$\begin{array}{r} 7 \times 10^{-3} \\ \hline \end{array}$$

(1)

(c) Work out  $4.2 \times 10^3 + 5.3 \times 10^2$   
Give your answer in standard form.

$$4730$$

$$\begin{array}{r} 4.73 \times 10^3 \\ \hline \end{array}$$

(2)

(Total for Question 23 is 4 marks)



- 24 A water tank is empty.  
Anil needs to fill the tank with 2400 litres of water.

Company **A** supplies water at a rate of 8 litres in 1 minute 40 seconds.  
Company **B** supplies water at a rate of 2.2 gallons per minute.

1 gallon = 4.54 litres

Company **A** would take more time to fill the tank than Company **B** would take to fill the tank.

How much more time?

Give your answer in minutes correct to the nearest minute.

A

$$\frac{2400}{8} = 300$$

$$40 \text{ seconds} = \frac{2}{3} \text{ Min.}$$

$$1 + \frac{2}{3} = \frac{5}{3}$$

$$300 \times \frac{5}{3} = \underline{\underline{500 \text{ mins}}}$$

B 2400 litres

$$\frac{2400}{4.54} = 528.6 \text{ gallons}$$

$$\frac{528.6}{2.2} = \underline{\underline{240.288 \text{ mins}}}$$

$$500 - 240 = \underline{\underline{260}}$$

..... 260 ..... minutes

(Total for Question 24 is 4 marks)



25 The first four terms of a Fibonacci sequence are

$$a \quad 2a \quad 3a \quad 5a \quad 8a$$

The sum of the first five terms of this sequence is 228

Work out the value of  $a$ .

$$a + 2a + 3a + 5a + 8a = 228$$

$$19a = 228$$

$$a = \underline{\underline{12}}$$

..... 12

(Total for Question 25 is 3 marks)

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

- 26 In a bag there are only red counters, blue counters, green counters and pink counters. A counter is going to be taken at random from the bag.

The table shows the probabilities of taking a red counter or a blue counter.

Colour	red	blue	green	pink
Probability	0.05	0.15	0.5	0.3

The probability of taking a green counter is 0.2 more than the probability of taking a pink counter.

- (a) Complete the table.

$$1 - 0.05 - 0.15 = 0.8$$

$$x + 0.2 + x = 0.8$$

$$2x + 0.2 = 0.8$$

$$2x = 0.6$$

$$x = 0.3$$

(2)

There are 18 blue counters in the bag.

- (b) Work out the total number of counters in the bag.

$$0.15x = 18$$

$$x = \frac{18}{0.15}$$

$$= 120$$

120

(2)

(Total for Question 26 is 4 marks)

OR

$$15\% \text{ of the total} = 18$$

$$\div 3 \quad \div 3$$

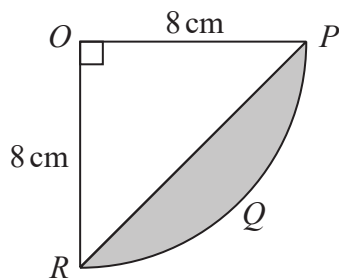
$$5\% \text{ of total} = 6$$

$$\times 20 \quad \times 20$$

$$100\% = \underline{\underline{120}}$$



27 The diagram shows a sector  $OPQR$  of a circle, centre  $O$  and radius 8 cm.



$OPR$  is a triangle.

Work out the area of the shaded segment  $PQR$ .  
Give your answer correct to 3 significant figures.

$$\begin{aligned} \text{Area of } \frac{1}{4} \text{ circle} &= \frac{\pi r^2}{4} \\ &= \frac{\pi (8)^2}{4} \\ &= 16\pi \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of triangle} &= \frac{1}{2} \times 8 \times 8 \\ &= 32 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Segment} &= 16\pi - 32 \\ &= \underline{18.3 \text{ cm}^2} \end{aligned} \quad \dots\dots\dots 18.3 \text{ cm}^2$$

(Total for Question 27 is 4 marks)

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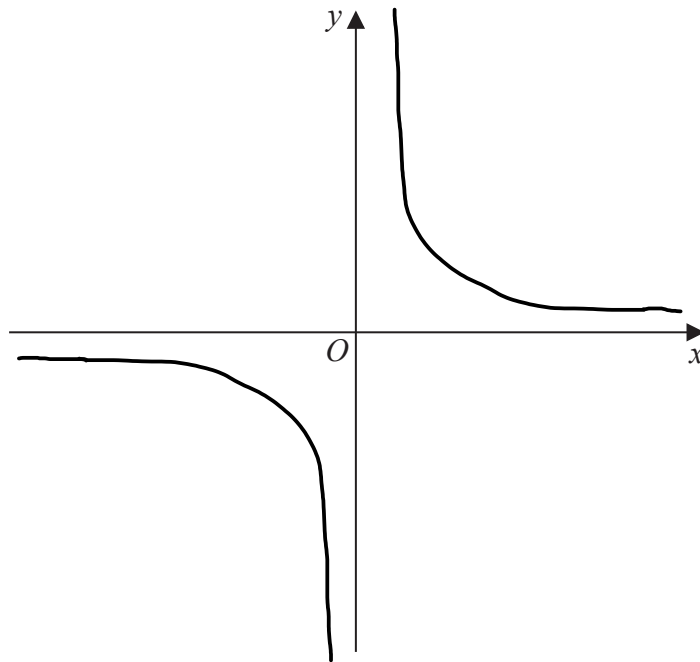
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P 6 4 6 3 3 A 0 2 1 2 4

28 Sketch the graph of  $y = \frac{1}{x}$



(Total for Question 28 is 2 marks)

**TOTAL FOR PAPER IS 80 MARKS**

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