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 π button, take the value of π 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 ▶

P64633A

E:1/1/1/1/1/1/1/1/

P 6 4 6 3 3 A 0 1 2 4

Pearson

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.

% $\xrightarrow{\div 100}$ D

45 ÷ 100 = 0.45

0.45

(Total for Question 1 is 1 mark)

2 Write down two factors of 35

1 35

5 7

5 , 7

(Total for Question 2 is 1 mark)

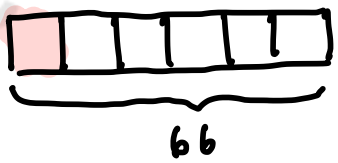
3 What is the time 2 hours 40 minutes after 8.05 am?

8.05 +2h 10.05 +40mins 10.45

10.45 am

(Total for Question 3 is 1 mark)

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



66

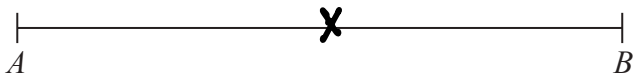
66 ÷ 6 = 11

11

(Total for Question 4 is 1 mark)

5 AB is a straight line.

Mark with a cross (×) the midpoint of AB.



(Total for Question 5 is 1 mark)

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

4ab

(1)

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

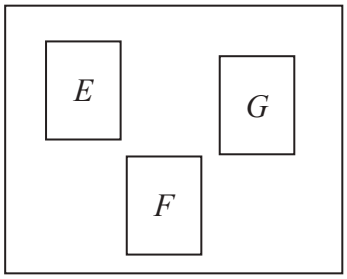
3x + 8

3x + 8

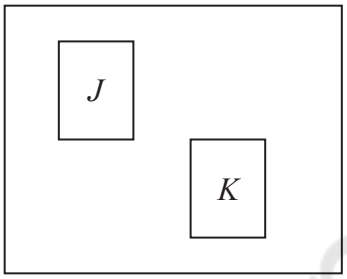
(2)

(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.

3 × 2 = 6

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
each night in a hotel	120
each theme park ticket	250

Show that Sandy pays more than 2500 dollars on Monday.

Tickets : 2 × 600 = 1200

Hotel : 7 × 120 = 840

Theme Park : 2 × 250 = 500

Total : 1200 + 840 + 500 = $2540

(Total for Question 8 is 3 marks)

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.

12-8

32-4-5

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

← 56-32

14-5

30-23

56-12-14

(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 ÷ £4.85 = 61.855... books

↓

61

61

(Total for Question 10 is 3 marks)

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

1h = 60 mins
2h = 120 mins
3h = 180 mins ← 196
4h = 240 mins

196 − 180 = 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.

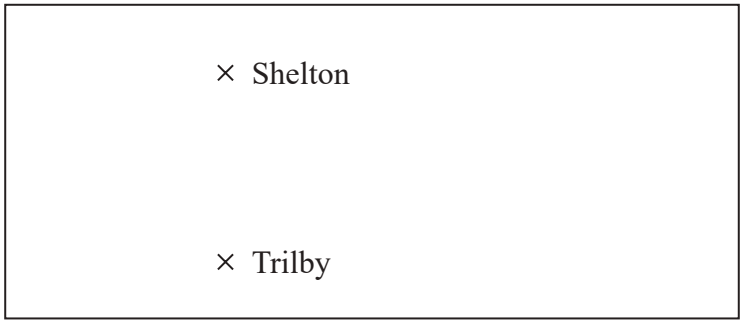
$S \quad \frac{D}{T}$ $\quad S = \frac{D}{T}$ $\quad D = x$ $\quad T = 2$ $\quad S = \frac{x}{2}$

$\frac{x}{2}$ miles per hour

(1)

(Total for Question 11 is 3 marks)

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 (1 cm = 20 km
2.5 cm = 50 km) ×2.5

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?

×5 (1 cm : 1200 cm
5 cm : 60,000 cm) ×5

100 cm = 1 m
÷100

60,000 ÷ 100 = 600

600 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.

L : W
2 : 3

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

40 %

(2)

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.

L = 20%.

W = 100 − 20 = 80%

L : W
20 : 80
÷20 ÷20
1 : 4

1 : 4

(2)

(Total for Question 13 is 4 marks)

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.

$1 - \frac{13}{15} = \frac{2}{15}$

$\frac{2}{15} \times 600,000,000 = 80,000,000$

£ 80 million

(Total for Question 14 is 3 marks)

15 Jenna measures all the angles around a point.

↳ Sum to 360°

Her results are 23°, 145°, 23° and 69°

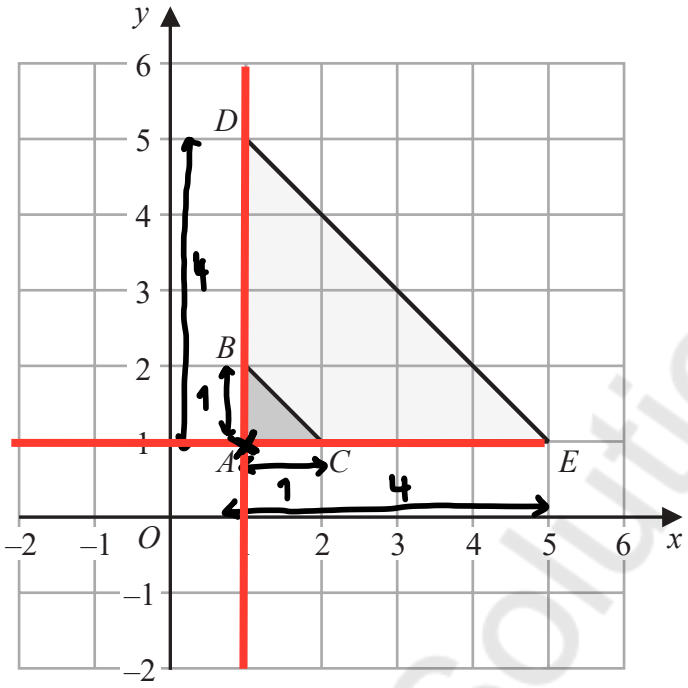
Explain why these results cannot be true.

$23 + 145 + 23 + 69 = 260°$

The angles do not sum to 360°

(Total for Question 15 is 1 mark)

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 of enlargement (1, 1)

(Total for Question 16 is 2 marks)

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

$y^2 + 5y$

$y^2 + 5y$

(1)

(b) Factorise $4a - 6$

HCF of 4 and 6 = 2

$2 \times 2a = 4a$

$2 \times -3 = -6$

$2(2a - 3)$

(1)

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

$10x - 8 = 21$

$+8 \quad +8$

$10x = 29$

$\div 10 \quad \div 10$

$x = 2.9$

$x =$ 2.9

(3)

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

$x^a \times x^b = x^{a+b}$

$4 \times 5 = 20$

$e^2 \times e^1 = e^{2+1} = e^3$

$f \times f^3 = f^{1+3} = f^4$

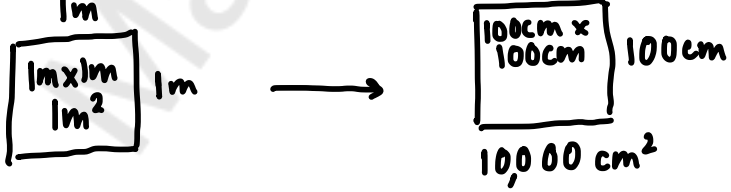
$20e^3f^4$

(2)

(Total for Question 17 is 7 marks)

18 Change 1 m^2 into cm^2

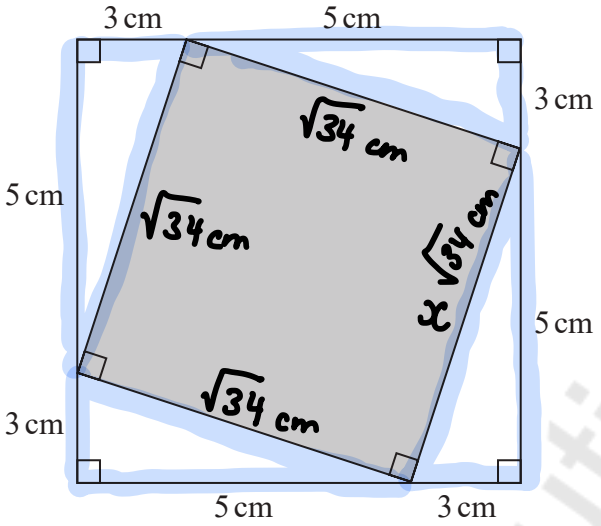
100cm = 1m



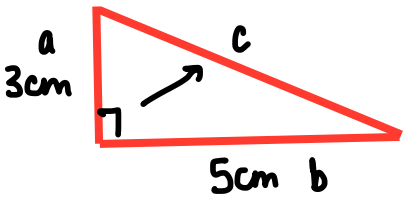
10,000 cm^2

(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.



$a^2 + b^2 = c^2$

$3^2 + 5^2 = c^2$

$\sqrt{\quad} \qquad \sqrt{\quad}$

$\sqrt{3^2 + 5^2} = c$

$\sqrt{34} = c$

Area square $= l \times w$

$= \sqrt{34} \times \sqrt{34}$

$= 34 \text{ cm}^2$

34 cm^2

(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.

15 17 18 19 19

20 22 22 24 25 25 28

32 33 35

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

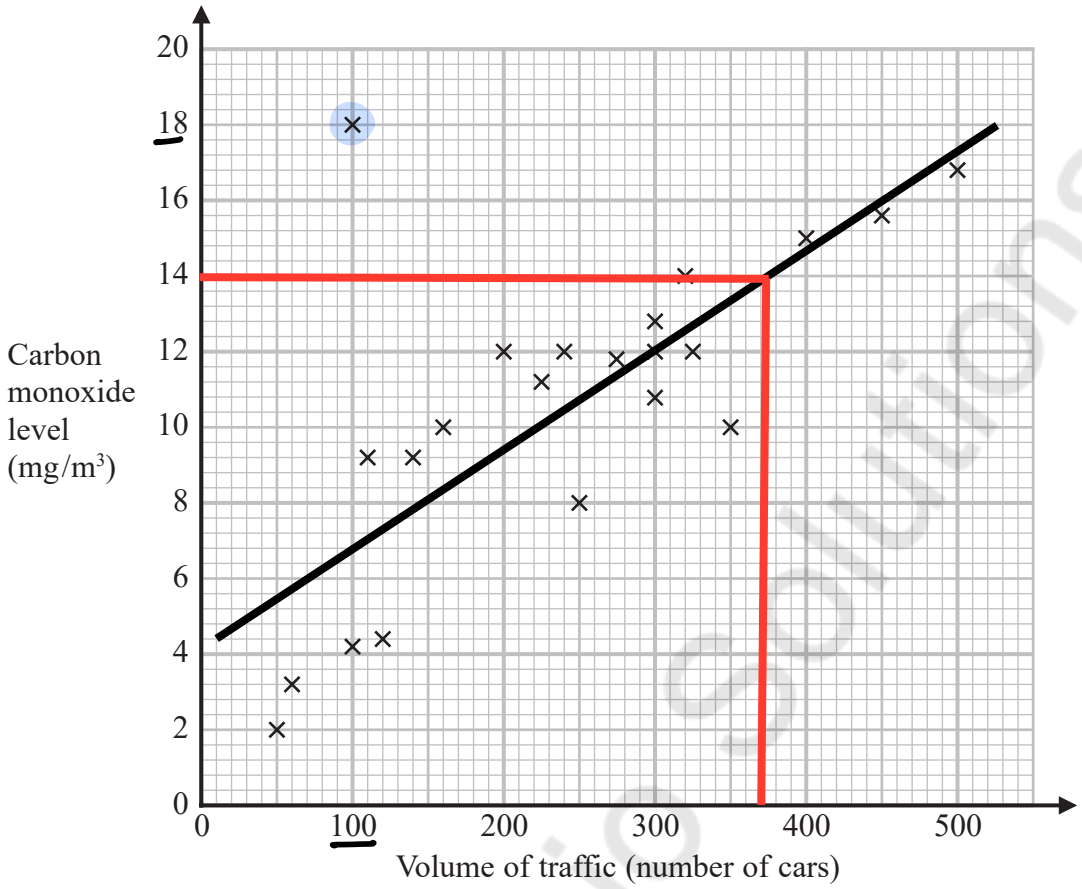
Key: 1 | 5 = 15 cm

↑ STEMS

↑ LEAVES (1 digit)

(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/m³

(2)

Alfie says,

"Because there is an outlier, there is no correlation."

(c) Is Alfie correct?
You must give a reason for your answer.

No, as outliers are ignored

(1)

(Total for Question 21 is 4 marks)

22 Natalie makes potato cakes in a restaurant.

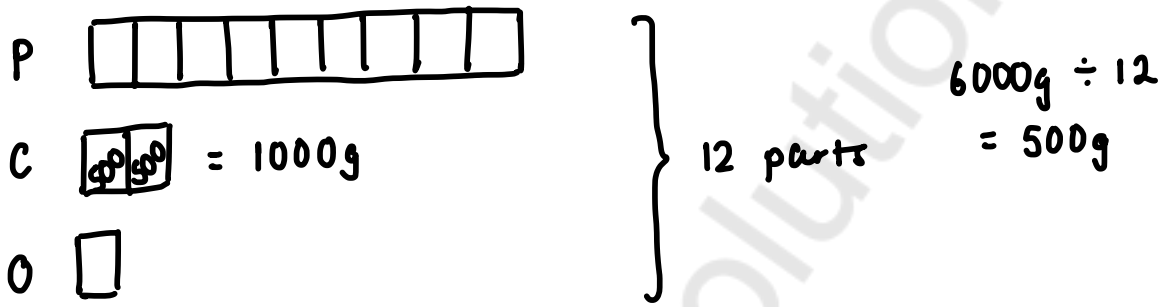
She mixes potato, cheese and onion so that

weight of potato : weight of cheese : 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.



(1000g ÷ 175g) x £2.25 = 12.857...

= £12.86

£ 12.86

(Total for Question 22 is 4 marks)

23 (a) Write 4.5×10^5 as an ordinary number.

4 5 0 0 0 0.

450,000

450,000

(1)

(b) Write 0.007 in standard form.

7 × 10^{-3}

7×10^{-3}

(1)

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

4200 = 4200

530 = 530 +

4730

4.73 × 10^3

4.73×10^3

(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

×4.54 → 9.988 L

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.

2400 ÷ 9.988
= 240.288346

Company A

8 L = 1m 40s

60s = 1m

÷60

÷60

0.6

8 L = 1.6 mins

×300 ( ) ×300

2400 L = 500 mins

Company B

9.988 L = 1m

×240. ( ) ×240.288...

2400 L = 240.288... mins

= 240 mins

500 − 240 = 260 mins more

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.

5th : $3a + 5a = 8a$

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

$19a = 228$

$\div 19 \qquad \div 19$

$a = 12$

12

(Total for Question 25 is 3 marks)

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
			$x + 0.2$	x

$= 1$

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

(a) Complete the table.

$0.05 + 0.15 = 0.2$

$1 - 0.2 = 0.8$

$x + 0.2 + x = 0.8$

$2x + 0.2 = 0.8$

$-0.2 \quad -0.2$

$2x = 0.6$

$\div 2 \quad \div 2$

$x = 0.3$

(2)

There are 18 blue counters in the bag.

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

$p(\text{blue}) = \dfrac{\text{no. of blue}}{\text{total counters}}$

$0.15 = \dfrac{18}{\text{total?}}$

$\text{total} = \dfrac{18}{0.15}$

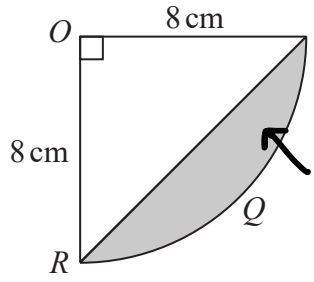
$\text{total} = 120$

120

(2)

(Total for Question 26 is 4 marks)

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



Area of sector OPQR − area of triangle

OPR is a triangle.

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

Area of sector OPQR $= \pi r^2 \div 4$ $\quad r = 8$

$= \pi(8)^2 \div 4$

$= \pi(64) \div 4$

$= 64\pi \div 4$

$= 16\pi \text{ cm}^2$

Area of triangle PQR $= \frac{1}{2}bh$ $\quad b = 8 \quad h = 8$

$= \frac{1}{2} \times 8 \times 8$

$= \frac{1}{2} \times 64$

$= 32 \text{ cm}^2$

Area of segment $= 16\pi - 32$

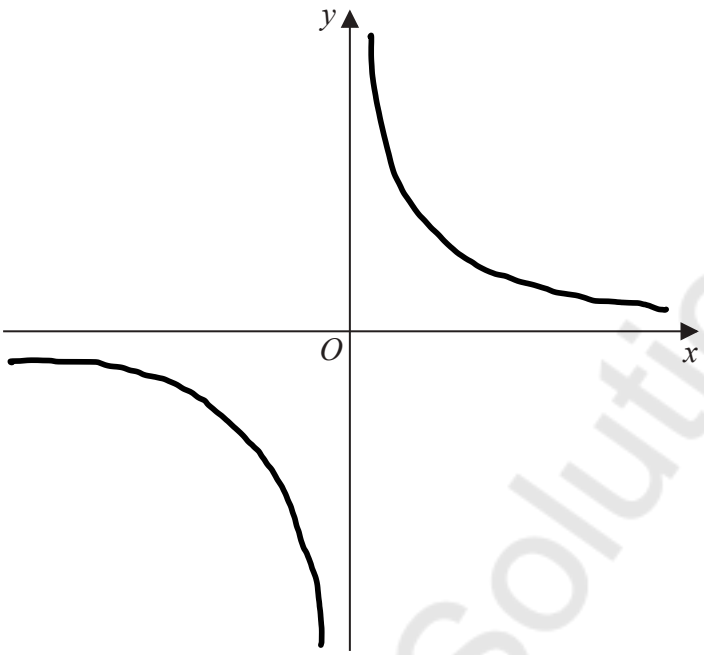
$= 18.265\ldots = 18.3$

18.3 ..... cm^2

(Total for Question 27 is 4 marks)

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

Reciprocal
Positive



(Total for Question 28 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

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