

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

©2021 Pearson Education Ltd.

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

.CG Maths.

Hints



Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

Anything written in green in a cloud doesn't have to be written in the exam.

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

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.

Percentages are out of 100 so dividing by 100 converts it into a decimal

.....

(Total for Question 1 is 1 mark)

2 Write down two factors of 35

Factors are whole numbers which 35 can be divided by to get a whole number result

.....

(Total for Question 2 is 1 mark)

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

$8^{\circ}5' + 2^{\circ}40' = hh^{\circ}mm'ss''$
Time can be entered into the calculator using the  button

..... am

(Total for Question 3 is 1 mark)

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

Of means to multiply

.....

(Total for Question 4 is 1 mark)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

2

.CG Maths.

5 AB is a straight line.

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

Halfway between A and B



(Total for Question 5 is 1 mark)

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

Writing a number before a letter means that they are multiplied.
Writing letters next to each other means they are multiplied

.....
(1)

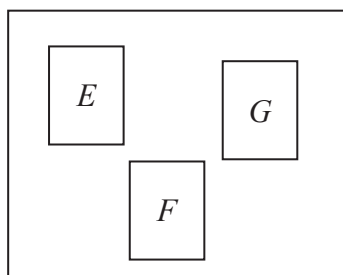
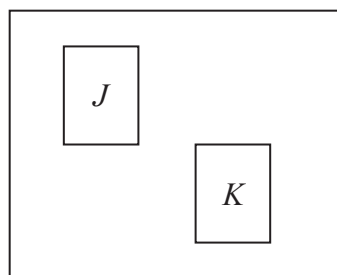
(b) Simplify $4x + 3 - x + 5$

Collect the like terms

.....
(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...

Use systematic listing

(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.

Multiply the number of each item by the cost of each item. Then add all the costs together to show the total Sandy pays. This should be more than \$2500

(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.

	Red	Blue	Black	Total
Plastic		5		32
Not plastic				
Total		14		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.

Dividing the amount of money she has by the cost of each book works out how many lots of the £4.85 go into the £300. The answer cannot be a decimal so needs to be rounded. Consider whether this needs to be rounded up or down

(Total for Question 10 is 3 marks)

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

$0^{\circ}196^{\circ} = hh^{\circ}mm'ss''$
Time can be entered into the
calculator using the  button

..... hours 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.

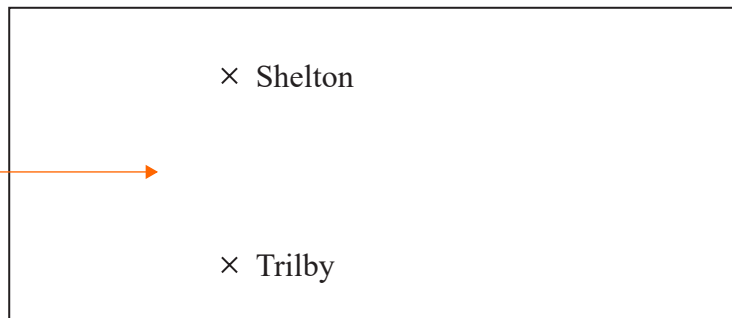
The unit of miles per hour mean that the distance
in miles needs to be divided by the time in hours

..... miles per hour
(1)

(Total for Question 11 is 3 marks)

12 The diagram shows two places on a map.

Measure the distance in centimetres using a ruler



Scale: 1 centimetre represents 20 kilometres

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

Multiply the distance in centimetres by 20

..... kilometres
(2)

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

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

1200 is 1200 times greater than 1. So the actual length is 1200 times greater than 5 centimetres. There are 100 centimetres in a metre

..... 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.

Express the number of parts for land as a fraction of the total number of parts in the ratio then convert it into a percentage by multiplying it by 100

.....%

(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.

Percentage is out of 100 so subtracting the percentage which is land from 100 works out the percentage which is water. Express the ratio as (the percentage which is land) : (the percentage which is water). The ratio does not need to be simplified

.....

(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.

'Of' means to multiply so multiplying the fraction by the total cost works out the cost for the building. Subtracting this from the total cost leaves the cost for the land. As the answer is given in millions, there is no need to work with the millions so 600 can be used instead of 600 million

£..... million

(Total for Question 14 is 3 marks)

15 Jenna measures all the angles around a point.

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

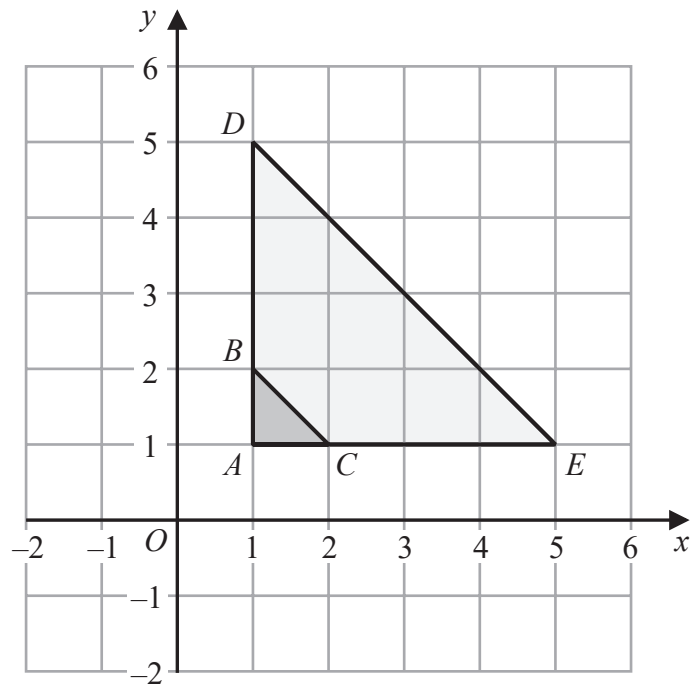
Explain why these results cannot be true.

Try adding the angles together

(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 ... centre...

It is an enlargement as it has changed size. The scale factor is the amount which all the sides have been multiplied by. The centre is where all of the points on the triangle move away from

(Total for Question 16 is 2 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



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

.....
(1)

(b) Factorise $4a - 6$

Put into brackets. Find the highest common factor of both terms and bring this out as a factor by dividing both terms by it and leaving the result in the bracket. Leave the factor outside the bracket

.....
(1)

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

Follow BIDMAS backwards and do the opposite operation to both sides of the equation to eliminate everything apart from x on the left side

$x =$

(3)

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

The multiplication can be done in any order. So 4×5 can be done first. Then multiply the e and f parts. $a^x \times a^y = a^{x+y}$

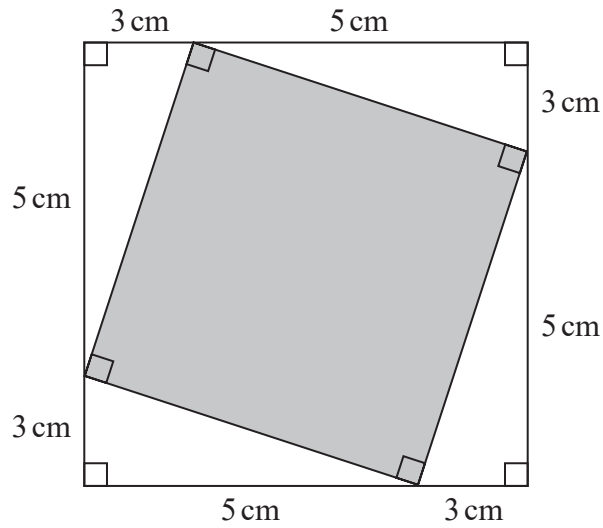
.....
(2)**(Total for Question 17 is 7 marks)**

18 Change 1 m^2 into cm^2

There are 100cm in 1m. The unit is squared so whatever 1m is multiplied or divided by to convert it into cm will need to be squared

..... 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.

Subtracting the area of the 4 triangles from the area of the larger square leaves the area of the shaded square. Area of square = length². Area of triangle = $\frac{1}{2} \times \text{base} \times \text{height}$. Remember to include a unit in the answer

(Total for Question 19 is 4 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

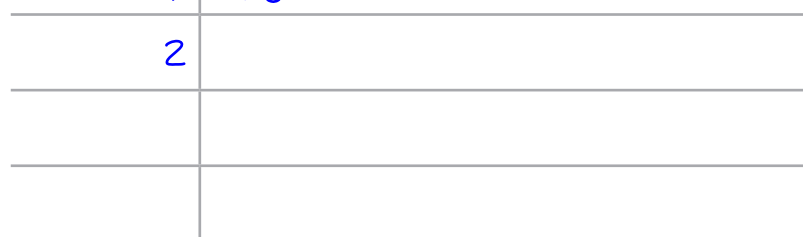
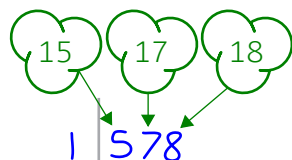
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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.



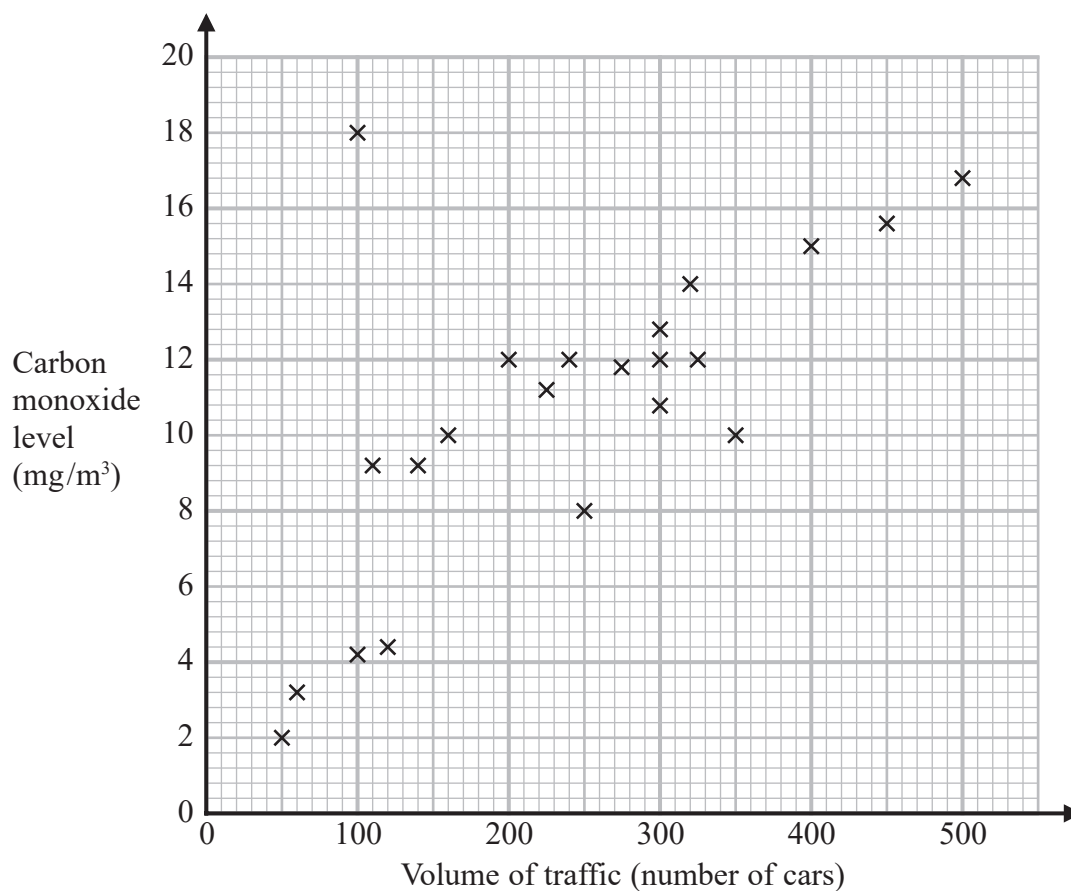
Key:

The numbers must be in order

(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.

The data all mostly follow a trend. There is one plotted point which is relatively far away from the other points and doesn't follow the trend

(.....,)
(1)

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

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

Read up to a point on the graph which is about in the middle of the surrounding data then read across. There is no need to draw a line of best fit and this can actually make it more difficult to make an estimate

..... mg/m³
(2)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Alfie says,

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

(c) Is Alfie correct?

You must give a reason for your answer.

No...

(1)

(Total for Question 21 is 4 marks)



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.

9 + 2 + 1 works out how many parts there are in total. This number of parts represents the total 6000g. So dividing the 6000 by this many parts works out what 1 part of the ratio is worth. Multiplying this by 2 works out what the 2 parts representing the cheese is worth. Dividing this by 175 works out how many lots of 175g the cheese is. Multiplying this by £2.25 works out the cost of this many lots of the cheese

£.....

(Total for Question 22 is 4 marks)

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

Type into calculator

.....
(1)

(b) Write 0.007 in standard form.

Type into calculator

.....
(1)

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

Type into calculator

Standard form is $a \times 10^n$, where $1 \leq a < 10$ and n is an integer. Keep dividing the answer by 10 until it is a number between 1 and 10 then multiply it by a power of 10 which multiplies by 10 that many times. $\times 10^y$ multiplies by 10 y times

.....
(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.

Subtracting the time for Company B from the time for Company A works out how many more minutes it takes. For Company A, $2400/8$ works out how many lots of the 8 litres are needed. Then multiplying this by the time taken per lot of 8 litres works out the total time taken. For Company B, convert the gallons into litres then divide the 2400 by this to work out how many minutes it takes

1°40°

Time can be entered into the calculator using the  button

..... minutes

(Total for Question 24 is 4 marks)

25 The first four terms of a Fibonacci sequence are

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

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

Work out the value of a .

In a Fibonacci sequence, the two previous terms are added to get the next term. Work out the fifth term then add together the first five terms. Set this equal to 228 and solve the equation

.....
(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

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

- (a) Complete the table.

Let p be the probability for pink. $p + 0.2$ must be the probability for green. Subtracting the probabilities for red and blue from 1 leaves the total probability for green and pink added together. Add together the expressions for the probability of pink and green and set it equal to the total probability for green and pink. Solve the equation to find p then add 0.2 to get the probability of green

(2)

There are 18 blue counters in the bag.

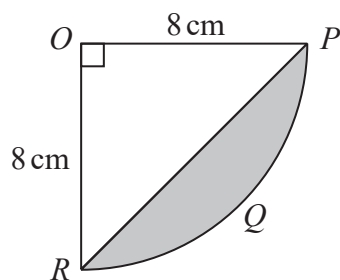
- (b) Work out the total number of counters in the bag.

Let x be the total number of counters. Multiplying this by the probability of blue expresses the number of blue counters, which is 18. Make an equation then rearrange it to solve for x

.....
(2)

(Total for Question 26 is 4 marks)

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.

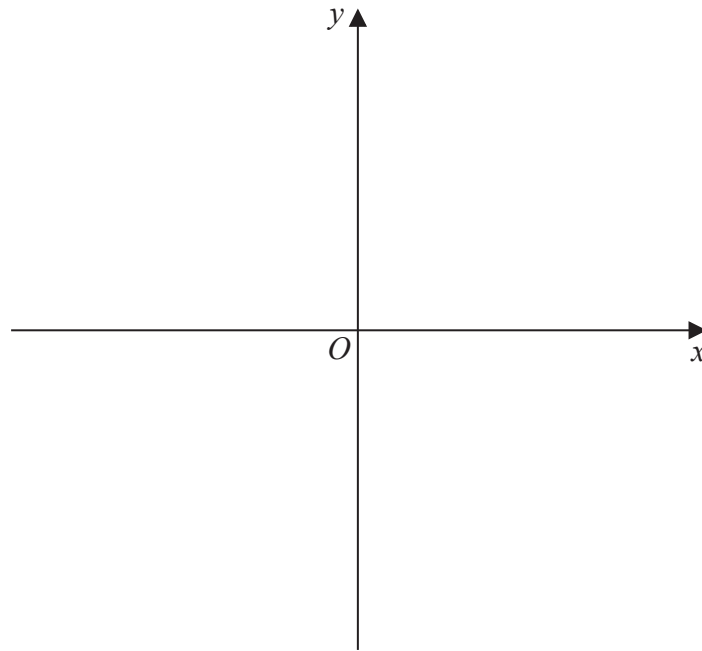
Subtracting the area of the triangle OPR from the sector $OPQR$ leaves the shaded segment PQR . The sector is a quarter of a whole circle.
Area of circle = $\pi \times \text{radius}^2$. Area of triangle = $1/2 \times \text{base} \times \text{height}$

..... cm²

(Total for Question 27 is 4 marks)

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

Using table mode to get a table of values. Set $f(x) = 1/x$. Table range, Start: -5, End: 5, Step: 1



(Total for Question 28 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

