Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Centre Number | | | | | |

Candidate Number | | | | |

Monday 11 November 2019

Afternoon (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.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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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

.CG Maths.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write down two factors of 12

Factors of 12 are whole numbers which 12 is divisible by

..... , ...

(Total for Question 1 is 1 mark)

2 Find $\frac{1}{3}$ of 30

'of' means to multiply

.....

(Total for Question 2 is 1 mark)

3 Write 0.7 as a fraction.

Type 0.7 into the calculator and it gives it as a fraction

.....

(Total for Question 3 is 1 mark)

4 Here is a list of numbers.

7 8 15 16 18 22

Write down the number from the list that is a multiple of 6

Go through the 6 times table until one of these numbers appears

.....

(Total for Question 4 is 1 mark)

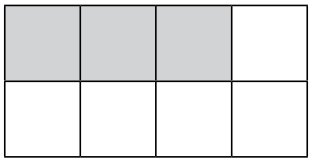
5 Change 4 kilometres into metres.

There are 1000 metres in a kilometre

..... metres

(Total for Question 5 is 1 mark)

6 Here is a grid of squares.



Write down the ratio of the number of shaded squares to the number of unshaded squares.

Number of shaded squares : number of unshaded squares

.....

(Total for Question 6 is 1 mark)

7 $w = 4u + 3$

Find the value of w when $u = 8$

Substitute u for 8. 4u means 4 multiplied by u

.....

(Total for Question 7 is 2 marks)

8 Here are the first five terms of a sequence.

1 +2 3 +3 6 +4 10 +5 15

Write down the next two terms of the sequence.

..... , ...

(Total for Question 8 is 2 marks)

9 Mrs Brown asked each child in her class which pet they liked best.

Here are her results.

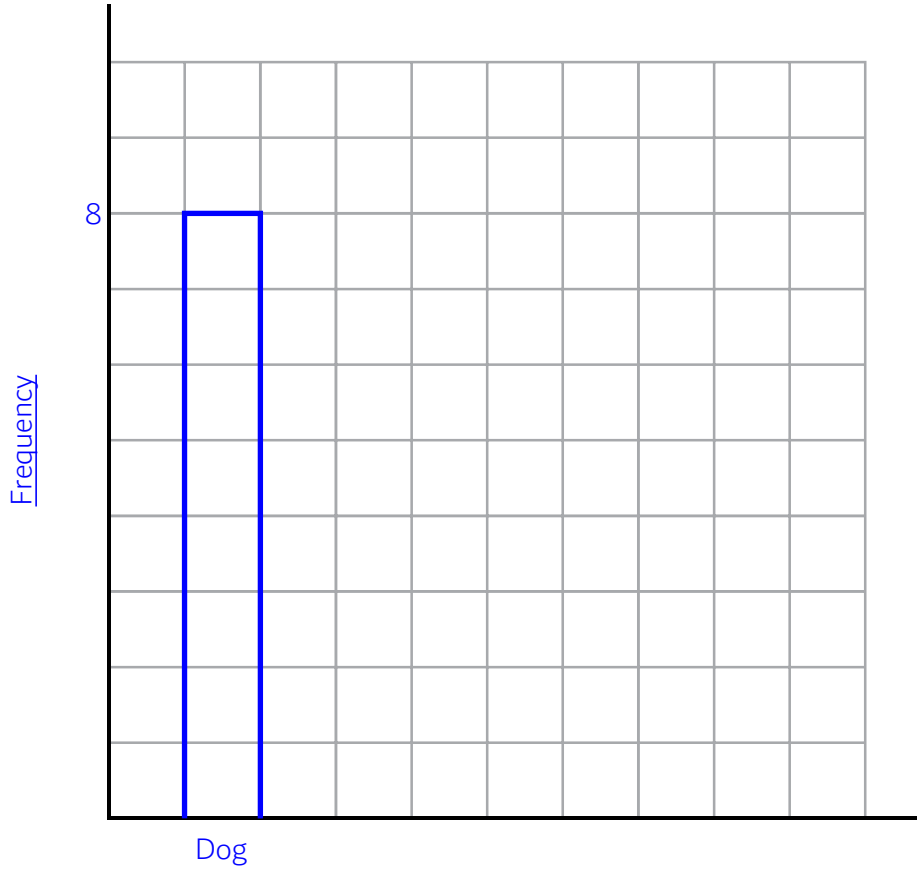
dog	rabbit	cat	dog	dog	hamster
cat	dog	rabbit	hamster	cat	cat
dog	dog	cat	dog	rabbit	dog

(a) Complete the frequency table for this information.

Pet	Tally	Frequency
dog	𝍸 | | |	8
rabbit		
cat		
hamster		

(2)

(b) On the grid below, draw a bar chart for this information.



(3)

(c) Write down the most popular pet.

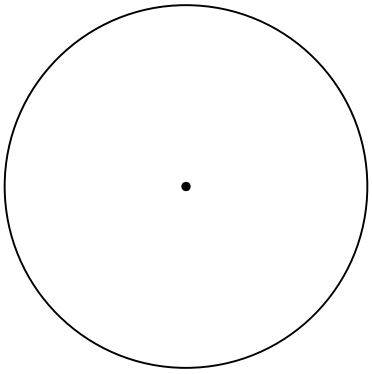
The pet with the highest frequency

.....

(1)

(Total for Question 9 is 6 marks)

10

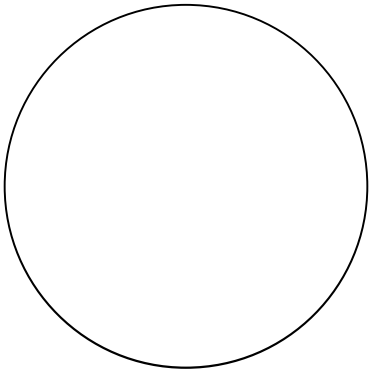


A straight line going through the centre which connects two points on the outside of the circle

(a) On the diagram above, draw a diameter of the circle.

(1)

(b) On the diagram below, draw a segment of the circle.
Shade the segment.



The area between a chord and the circumference. A chord is a straight line connecting two points on the outside of the circle. The circumference is the outside of the circle

(1)

(Total for Question 10 is 2 marks)

11 Dylan buys 13 bicycle lights for £7.50 each.
He pays with five £20 notes.

(a) How much change should Dylan get?

Work out the total cost of the 13 bike lights then subtract this from the total amount he paid to leave the change

£.....

(3)

The normal price of a bicycle is £120

In a sale, there is $\frac{1}{5}$ off the normal price of the bicycle.

(b) Work out the price of the bicycle in the sale.

Work out the fraction of the normal price it reduces to. Work out this fraction of the normal price

£.....

(2)

(Total for Question 11 is 5 marks)

12 Cornflakes are sold in two sizes of box.

Size of box	Weight of cornflakes
small	450 g
large	750 g

Rae buys 3 small boxes of cornflakes and some large boxes of cornflakes.
In total she buys 5850 g of cornflakes.

Work out the number of large boxes of cornflakes Rae buys.

Work out the total mass of the 3 small boxes. Subtracting this from the 5850 leaves the mass of the large boxes. Dividing this by 750 works out how many lots of 750 it is and therefore how many large boxes there were

.....

(Total for Question 12 is 3 marks)

13 The stem and leaf diagram below gives information about the ages of people in a social club.

3	1	4	5			
4	0	2	2	5	6	
5	0	1	7	7	8	9
6	3	4	5	9		
7	0	4				

Key: 4|2 represents 42 years

This represents 58

Find the range of these ages.

Range = largest - smallest

..... years

(Total for Question 13 is 2 marks)

14 Here is a rectangle.

Coby has to find the perimeter of this rectangle.

He writes,

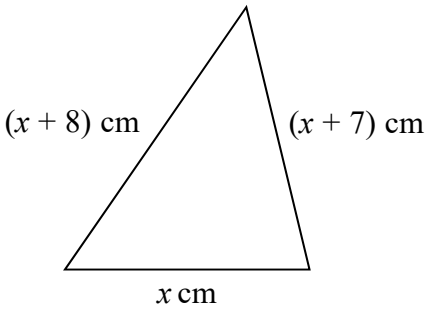
Perimeter = 7×3

(a) What mistake has Coby made?

Perimeter is all of the outside edges added together

(1)

Here is a triangle.



Iram solves a problem about this triangle to find the value of x.

Her answer is

$x = -2$

(b) Explain why Iram's answer must be wrong.

Consider what the lengths of the triangle would be if x = -2

(1)

(Total for Question 14 is 2 marks)

15 There are 800 students at a school.
Each student has either a school dinner or a packed lunch.

31% of the students have packed lunches.

55% of the students are boys.
60% of the boys have school dinners.

How many girls have packed lunches?
You must show all your working.

Do a two way table to organise the information. There is no need to complete the whole table. To do 31% of the students, convert the 31% to a fraction by putting it over 100 then multiply the 31/100 by the 800

	PL	SD	
B			
G			
			800

.....

(Total for Question 15 is 4 marks)

16 In a bag there are only red counters, blue counters, green counters and yellow counters.
A counter is taken at random from the bag.

The table shows the probabilities of getting a red counter or a yellow counter.

Colour	red	blue	green	yellow
Probability	0.4	.....	.....	0.25

the number of blue counters : the number of green counters = 3 : 4

Complete the table.

It is certain to get one of the four colours so their probabilities must add up to 1. So subtracting the probability of red and the probability of yellow from 1 leaves the probability of getting blue or green. Dividing this by 7, as there are 7 parts in total in the ratio which represent the total probability of blue or green, works out the value of 1 part of the ratio. Then work out the value of the 3 parts and 4 parts to work out the probabilities of blue and green

(Total for Question 16 is 4 marks)

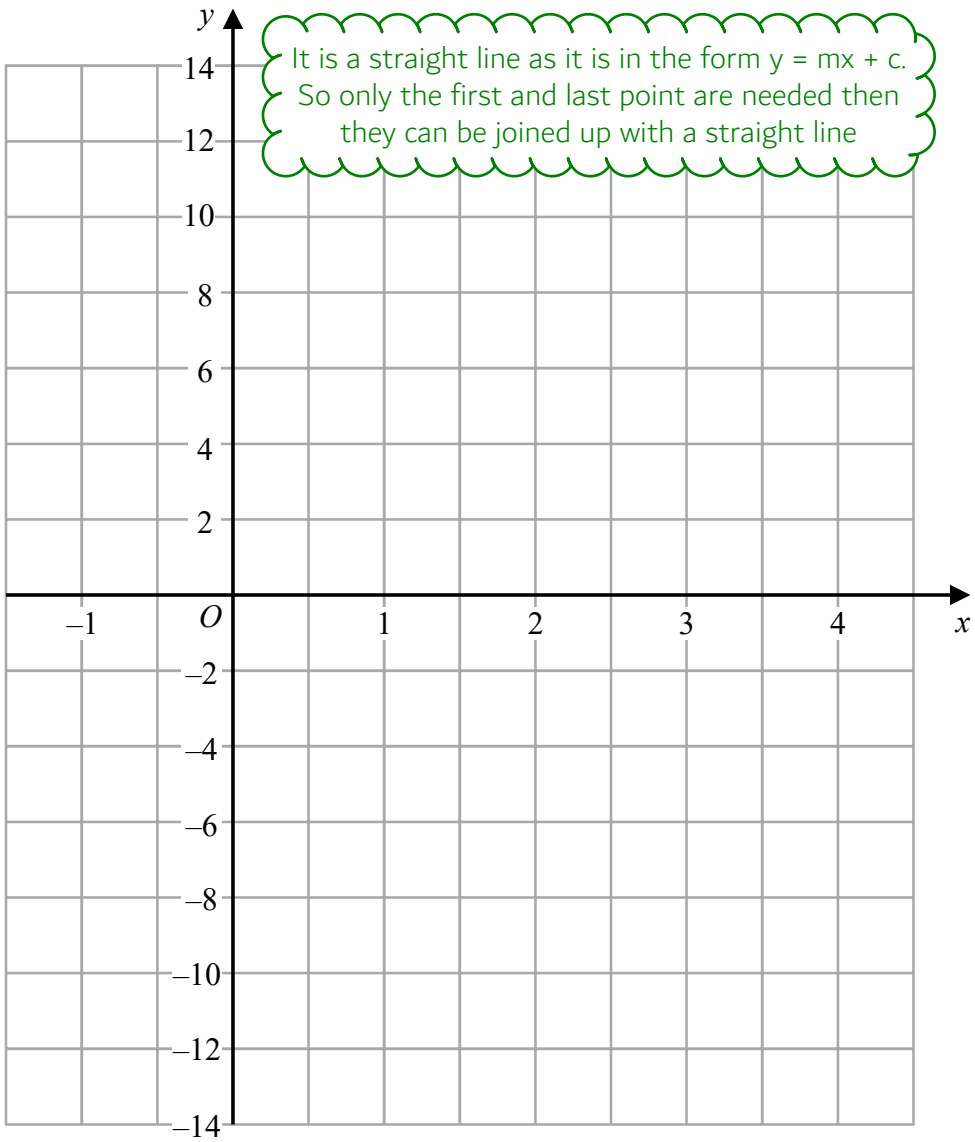
17 (a) Complete the table of values for $y = 4x - 6$

x	−1	0	1	2	3	4
y			−2			10

Use table mode. f(x) = 4x - 6. Start: -1. End: 4. Step: 1

(2)

(b) On the grid, draw the graph of $y = 4x - 6$ for values of x from −1 to 4

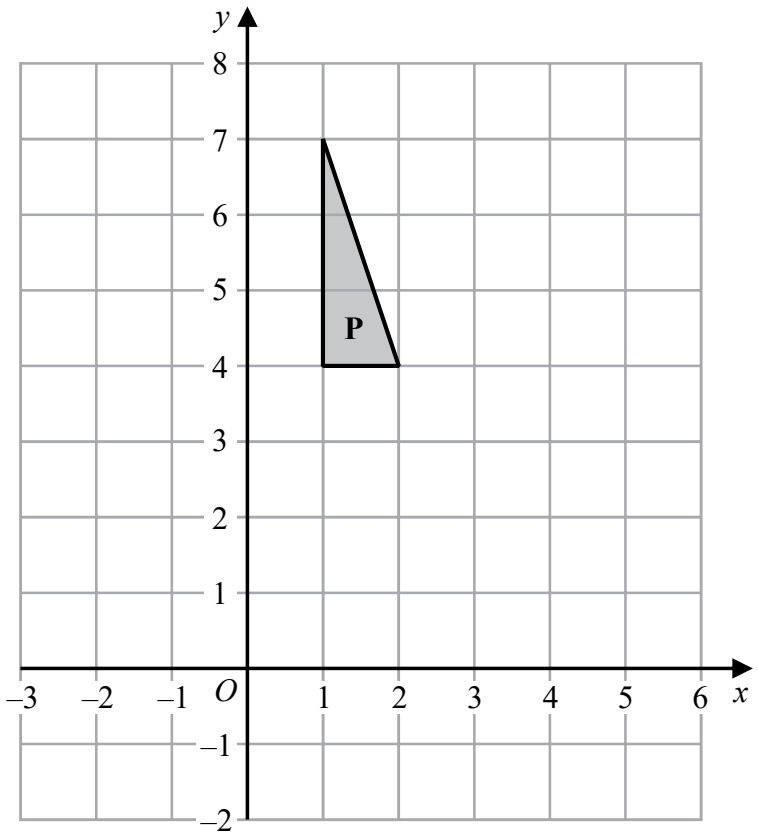


It is a straight line as it is in the form y = mx + c.
So only the first and last point are needed then they can be joined up with a straight line

(2)

(Total for Question 17 is 4 marks)

18



Reflect shape **P** in the line $y = 3$

(Total for Question 18 is 2 marks)

Draw the line of y = 3. This should be a horizontal line which crosses the y-axis at 3. Reflect the corners first by counting the number of jumps to the line and doing the same number on the other side. Then join up the corners with straight lines to form the reflected triangle

19 Solve $4(x - 6) = 44$

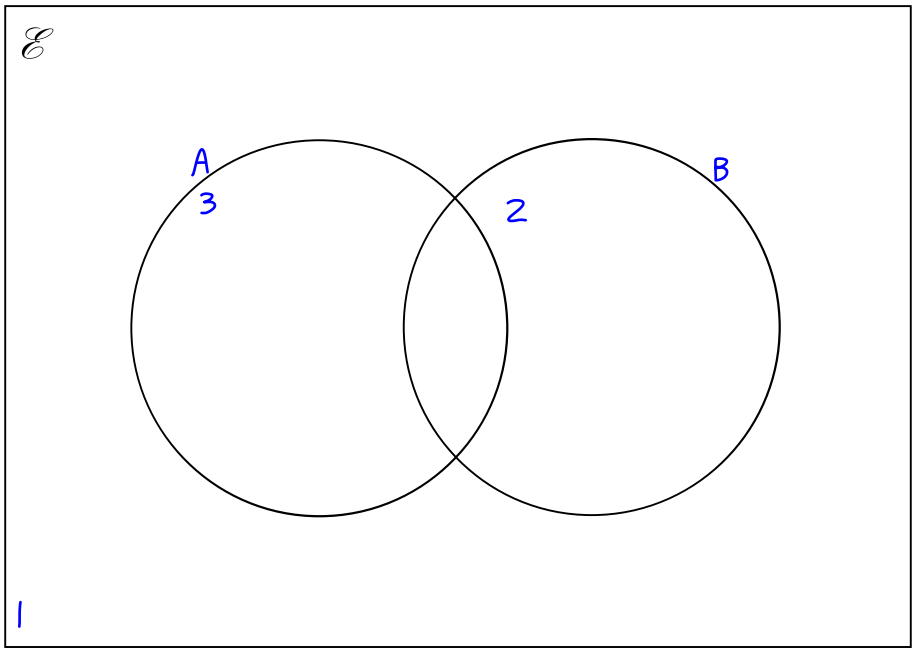
Follow BIDMAS backward and do the opposite operation to both sides to eliminate everything apart from x on the left

$x =$ .....

(Total for Question 19 is 2 marks)

20 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}$
$A = \{\text{multiples of } 3\}$
$B = \{\text{even numbers}\}$

Complete the Venn diagram for this information.



(Total for Question 20 is 4 marks)

21 Franco buys a house for £146 500
He sells the house for £158 220

Calculate the percentage profit Franco makes.

Subtracting the original price from the new price works out the change. Putting this over the original works out the fraction change. Multiplying this by 100 works out the percentage change, which is the percentage profit

..... %

(Total for Question 21 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

22 (a) Expand and simplify $(x + 5)(x - 9)$

.....

(2)

(b) Factorise fully $9x^2 + 6x$

Bring out the highest common factor of both terms and leave the remainder in a bracket

.....

(2)

(Total for Question 22 is 4 marks)

---

23 (a) Use your calculator to work out $\dfrac{29^2 - 4.6}{\sqrt{35 - 1.9^3}}$

Write down all the figures on your calculator display.

157.66...

(2)

(b) Write your answer to part (a) correct to 4 significant figures.

Round the fourth figure using the fifth figure. Then set everything after the fourth figure to 0 and ignore them

.....

(1)

(Total for Question 23 is 3 marks)

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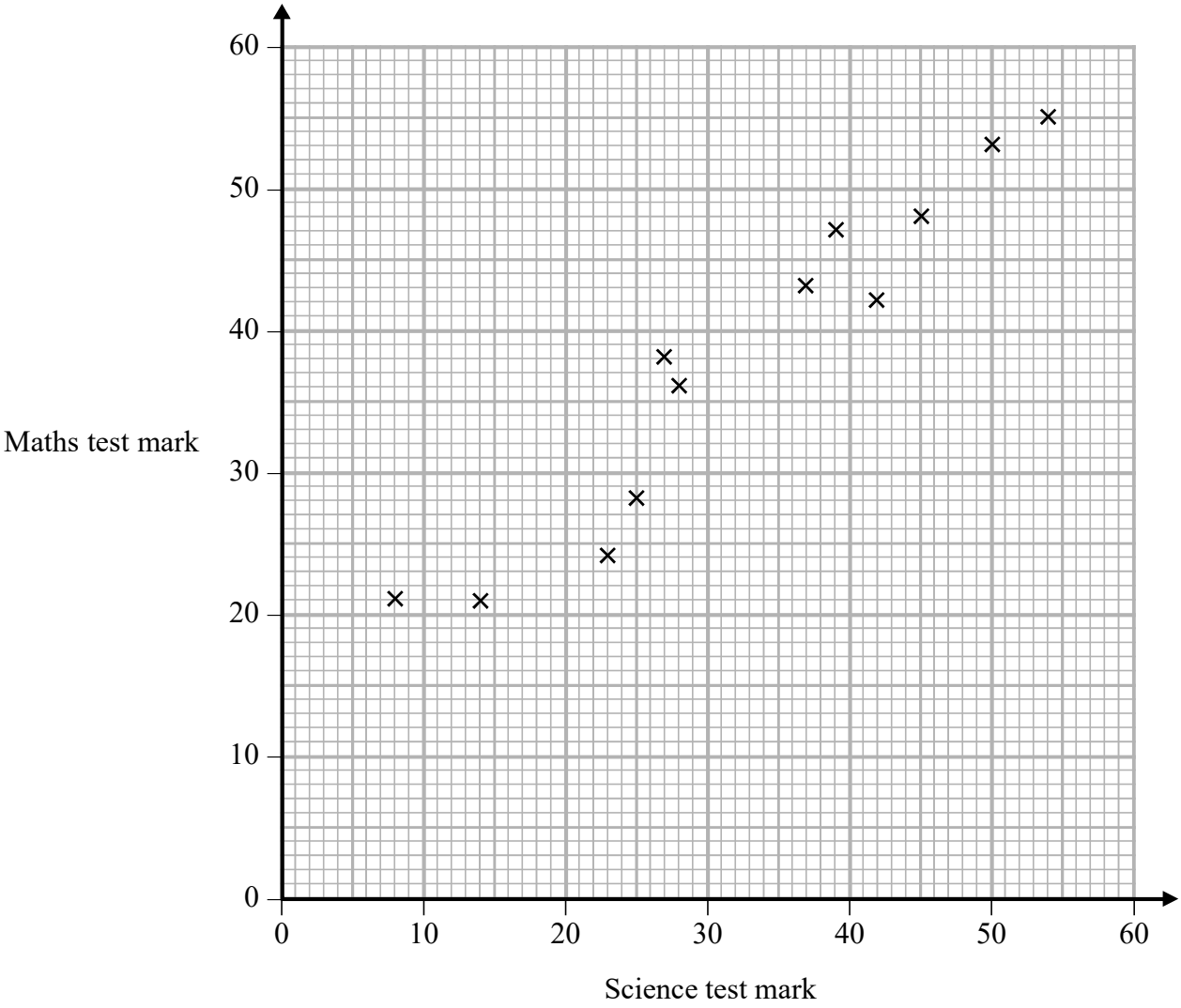
24 The scatter graph shows information about the marks a group of students got in a Science test and in a Maths test.



Jamie got a mark of 34 in the Science test.

Using the scatter graph, find an estimate for Jamie's mark in the Maths test.

Reading up from 34 to somewhere in the middle of the data points close by then reading across works out the estimate. There is no need to draw a line of best fit as this may make it harder to get an easy value to read

.....

(Total for Question 24 is 2 marks)

25 The table gives information about the times taken, in seconds, by 18 students to run a race.

Time (t seconds)	Frequency
$5 < t \leqslant 10$	1
$10 < t \leqslant 15$	2
$15 < t \leqslant 20$	7
$20 < t \leqslant 25$	8

Work out an estimate for the mean time.
Give your answer correct to 3 significant figures.

Working out the mean of the upper and lower bound of each interval works out the midpoints. To do this, the upper and lower bound are added for each interval then divided by 2 as there are 2 numbers. The midpoint is the best estimate for the values of each of the times. Multiplying the midpoints by the frequencies works out the estimated total time for each interval. Adding all of these together works out an overall estimated total time for all 18 students. Mean = total/number, so the estimated total time is divided by the 18 students

..... seconds

(Total for Question 25 is 3 marks)

26 Write 37 cm^3 in mm^3

There are 10mm in 1cm so multiplying by 10 converts centimetres into millimetres. However the unit is cubed so the effect is cubed

..... mm^3

(Total for Question 26 is 1 mark)

27 Nimer was driving to a hotel.
He looked at his Sat Nav at 13 30

Time	13 30
Distance to destination	65 miles

Nimer arrived at the hotel at 14 48

Work out the average speed of the car from 13 30 to 14 48
You must show all your working.

From the unit of mph, the number of miles needs to be divided by the time in hours. Subtracting the 13 30 from 14 48 works out how much time the journey took

Time can be put into the calculator by using the time button

..... mph

(Total for Question 27 is 4 marks)

28 (a) Write 32 460 000 in standard form.

The number needs to be divided by 10 n times to make it between 1 and 10. So it needs to be multiplied by 10^n to keep it equal. Standard form is a x 10^n, where $1 \leq a < 10$ and n is an integer

.....

(1)

(b) Write 4.96×10^{-3} as an ordinary number.

x 10^{-3} means to divide by 10 3 times. This moves the decimal point 3 times to the left

.....

(1)

Asma was asked to compare the following two numbers.

$$A = 6.212 \times 10^8 \quad \text{and} \quad B = 4.73 \times 10^9$$

She says,

"6.212 is bigger than 4.73 so A is bigger than B."

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

No...

.....

.....

.....

(1)

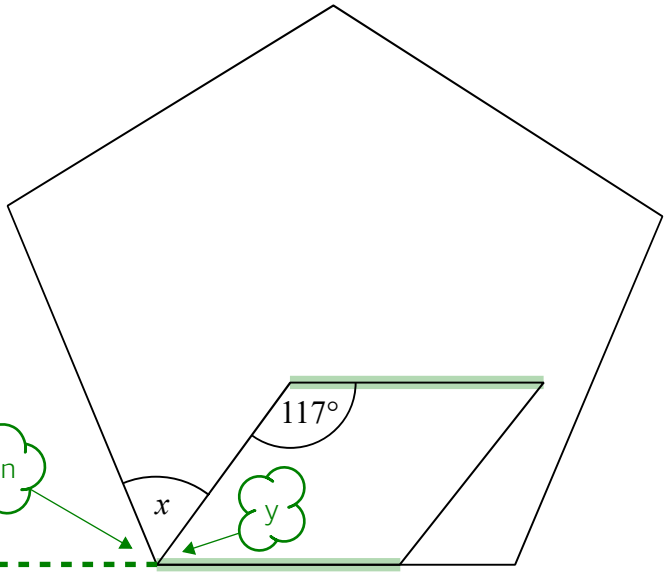
(Total for Question 28 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

29 The diagram shows a regular pentagon and a parallelogram.



Exterior angle of the pentagon

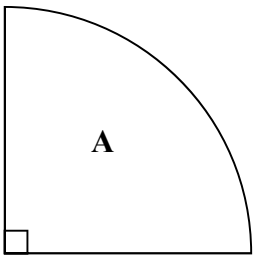
Work out the size of the angle marked x.
You must show all your working.

The exterior angles of any polygon add up to 360°. There are 180° around a point on a straight line. The exterior angle and interior angle (x and y combined) lie on a straight line. Co-interior angles add up to 180°. Subtracting angle y from the interior angle leaves angle x

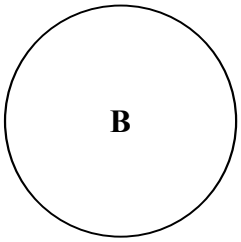
.....°

(Total for Question 29 is 4 marks)

30 **A** is in the shape of a quarter circle of radius 15 cm.
B is in the shape of a circle.



15 cm



The area of **A** is 9 times the area of **B**.

Show that the radius of **B** is 2.5 cm.

Area of a circle = π x radius^2. The area of A is expressed by using the formula for the area of a circle by substituting in 15 as the radius then dividing by 4 as it is a quarter of a full circle. Multiplying the area of B by 9 makes it equal to the area of A. Leave r as the radius. Form an equation then rearrange to find r

(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS