

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)**

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**Thursday 7 November 2019**

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/2F**

**Mathematics**

**Paper 2 (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.
- 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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**.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](mailto: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 these numbers in order of size.  
Start with the smallest number.

8    -4    1    -7    -2

The less positive or the more negative a number is, the smaller it is

(Total for Question 1 is 1 mark)

- 2 Write the number 8375 correct to the nearest thousand.

The 8 is in the thousands place. The 3 in the next place causes it to round down and everything after the thousands is ignored and set to 0

(Total for Question 2 is 1 mark)

- 3 Write 0.23 as a percentage.

To convert a decimal to a percentage, multiply it by 100

..... %

(Total for Question 3 is 1 mark)

- 4 Find the value of  $\sqrt{17.64}$

Type into the calculator

.....

(Total for Question 4 is 1 mark)

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5 Find the value of  $6^5$

Type into the calculator

.....

(Total for Question 5 is 1 mark)

6 There are 14 rows of seats in a cinema.  
There are 15 seats in each row.

A film was shown in the cinema on Saturday.  
Each ticket for the film cost £6.50

The tickets that were sold cost a total of £1274

How many tickets were **not** sold?

Multiplying the 14 rows by the 15 seats in each row works out how many seats there are.  
Dividing the £1274 by the £6.50 works out how many tickets were sold. Subtracting the number of tickets sold from the number of seats works out how many tickets were not sold

.....

(Total for Question 6 is 3 marks)

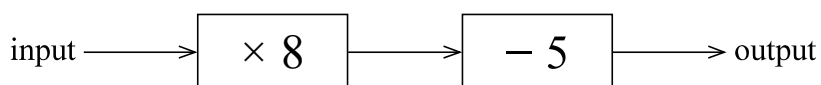
- 7 Harry has 20 sweets.  
He gives 7 of the sweets to Nadia.

What fraction of the 20 sweets does Harry have now?

Subtracting the 7 sweets from the 20 works out how many sweets Harry has now. Express this as a fraction of the 20 sweets

(Total for Question 7 is 2 marks)

- 8 Here is a number machine.

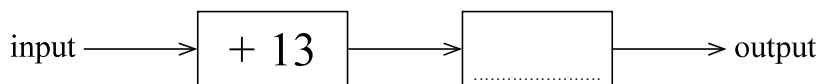


- (a) Work out the output when the input is 6

Multiply 6 by 8 then subtract 5

(1)

Here is a different number machine.



When the input is 17, the output is 10

- (b) Complete the number machine.

$$17 + 13 = 30$$

Work out what must be subtracted from 30 to get 10

(1)

(Total for Question 8 is 2 marks)

9 Here is a list of numbers.

6 4 8 9 4 3

(a) Work out the median.

Write the numbers in order then cross off from either end until the two middle numbers are found. Work out the mean of these two numbers to work out the median

.....  
(2)

Aisha picks at random one of the numbers.

(b) What is the probability that she picks an odd number?

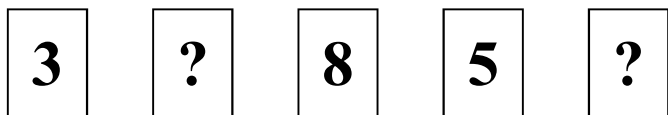
Express the fraction of the 6 numbers which are odd

.....  
(2)

Clara has five cards.

There is a number on each card.

Two of the numbers are hidden.



The mode of the five numbers is 3

The mean of the five numbers is 5

(c) Work out the two numbers that are hidden.

Mode is the number which appears the most. So there must be more 3s than any other number

Writing the formula triangle for mean.  
m is the mean, t is total and n is number

m  
t  
n

Work out the total of the five numbers then subtract the known numbers to find the last hidden number

.....  
(2)

(Total for Question 9 is 6 marks)

10 Here is the charge at a car park in Spain.

<p style="text-align: center;"><b>Car park</b> 0.024 euros per minute</p>
---

Jon parked his car in this car park.

Jon drove into the car park at 10 45

When he drove out of the car park he had to pay 8.40 euros.

At what time did Jon drive out of the car park?

Work out how many lots of 0.024 euros were spent. The car was in the car park for this many minutes. Add this many minutes to the 10 45 using the time button on the calculator

.....  
(Total for Question 10 is 3 marks)

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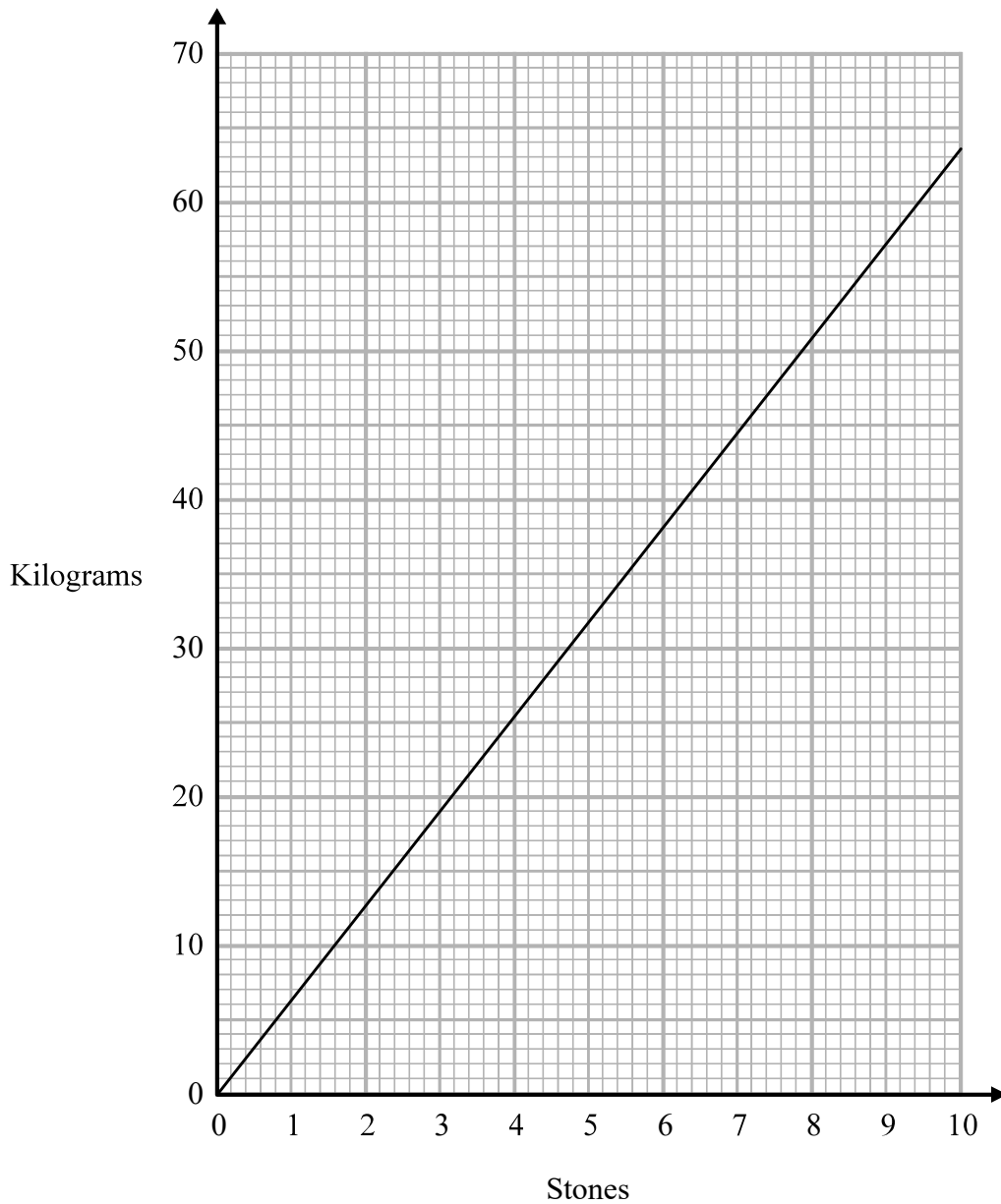
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11 You can use this graph to change between stones and kilograms.



(a) Change 3 stones to kilograms.

Reading up from 3 stones to the line then across converts the 3 stones into kilograms

..... kilograms  
(1)

(b) Change 80 kilograms to stones.

80kg is not on the graph. Find the largest factor of 80 which is on the graph then convert this into stones. Multiply this by the amount 80 was divided by to get the factor

..... stones  
(2)

(Total for Question 11 is 3 marks)



12 Find the number that is exactly halfway between  $\frac{1}{10}$  and  $\frac{3}{5}$

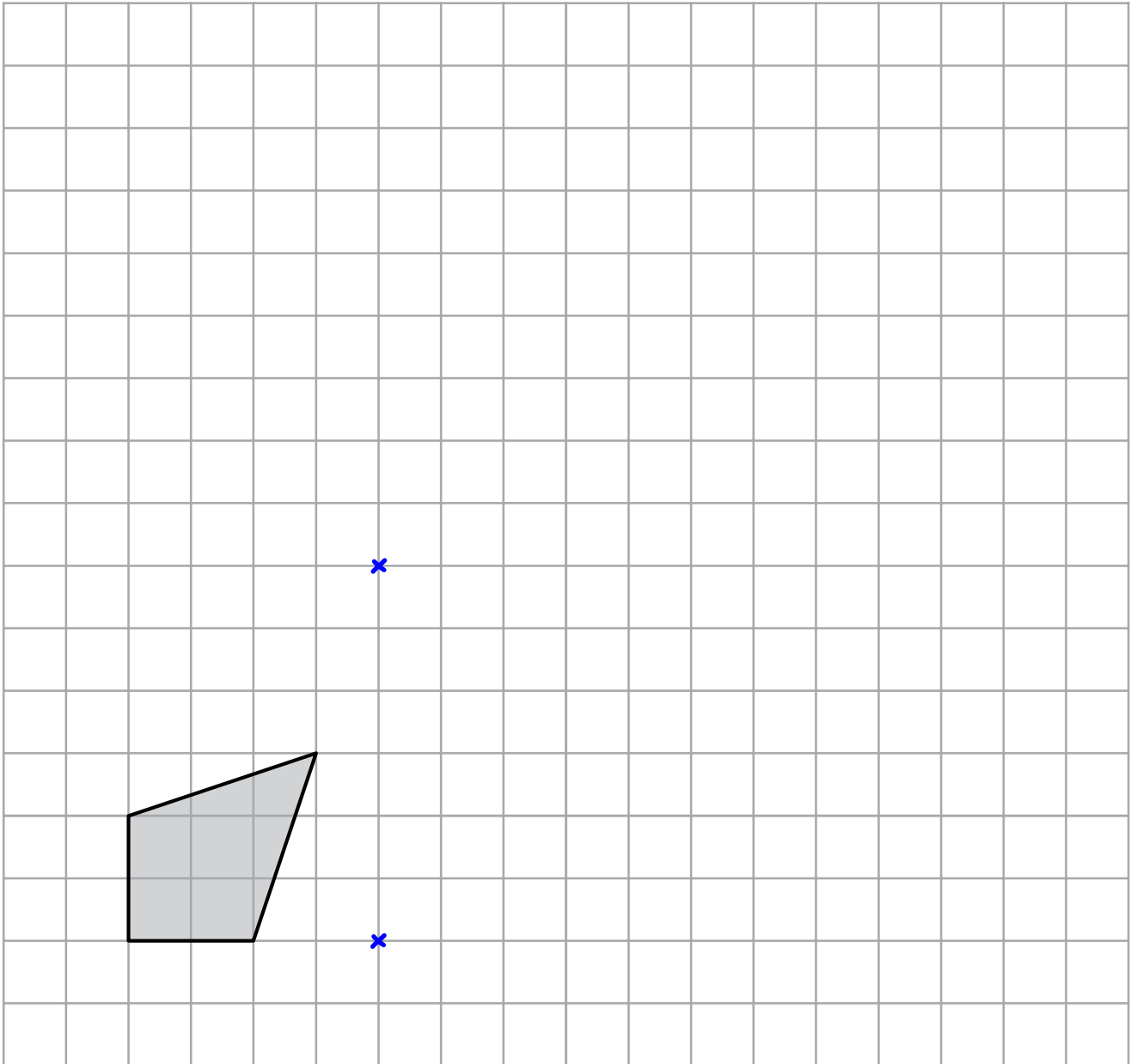
Working out the mean of the two fractions works out what is exactly halfway between them

(Total for Question 12 is 2 marks)

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On the grid, draw an enlargement of the shaded shape with a scale factor of 3

(Total for Question 13 is 2 marks)

All the sides are 3 times as long. First drawing the corners then joining them up

- 14 A shop sells compost in 20 litre bags and in 40 litre bags.  
One day the shop had two special offers for the compost.



Which offer is the better value for money?  
You must show how you get your answer.

Dividing the cost by the number of litres works out the cost per litre. The one with the lowest cost per litre is the better value

(Total for Question 14 is 3 marks)

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15 The length of a plane is 19.2 metres.

Lukas buys a scale model of the plane.  
The scale of the model is 1 : 24

Work out the length of the scale model of the plane.  
Give your answer in centimetres.

There are 100cm in 1m. Use this fact to convert the 19.2 metres into centimetres. The 24 parts of the ratio is 24 times greater than the 1 part which represents the scale model

..... centimetres

**(Total for Question 15 is 3 marks)**

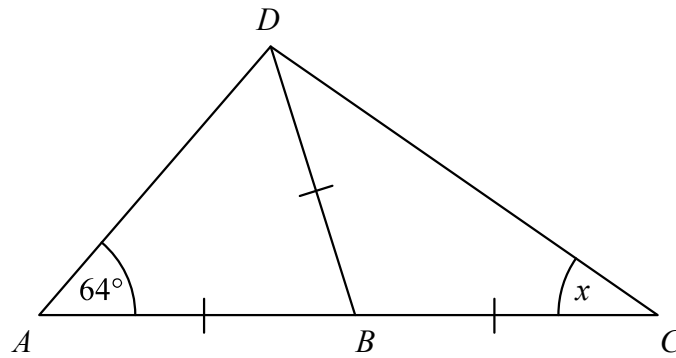
16 Maria invests £4500 in a savings account for 3 years.  
The account pays simple interest at a rate of 1.8% per year.

Work out the total amount of interest Maria gets by the end of the 3 years.

Percentage is out of 100 so dividing the 1.8 by 100 converts it into a fraction. Multiplying the £4500 by this fraction finds 1.8%. As it is simple interest, the amount of interest is the same every year so multiplying it by 3 works out the interest by the end of the 3 years

£.....

**(Total for Question 16 is 2 marks)**



$ABC$  is a straight line.

$AB = BC = BD$ .

Angle  $DAB = 64^\circ$

Work out the size of the angle marked  $x$ .

Give a reason for each stage of your working.

Triangles  $ADB$  and  $BCD$  are isosceles as two of the sides in each triangle are equal. Base angles of an isosceles triangle are equal. Angles in a triangle add up to  $180^\circ$ . Angles around a point on a straight line add up to  $180^\circ$

(Total for Question 17 is 4 marks)

- 18 Ben is  $n$  years old.  
 Chloe is twice as old as Ben.  
 Dan is five years younger than Ben.

The total of Ben's age, Chloe's age and Dan's age is  $T$  years.

- (a) Find a formula for  $T$  in terms of  $n$ .

Adding together all of their ages gives the total age,  $T$ . The formula does not need to be simplified

$T =$  .....

(3)

- (b) In the table below, put a tick (✓) in the box next to the identity.

The identity is always true regardless of what the unknowns are

$3h + 2 = 14$	<input type="checkbox"/>
$3a + 4b - 2c$	<input type="checkbox"/>
$A = \pi r^2$	<input type="checkbox"/>
$5m - 3m = 2m$	<input type="checkbox"/>
$x + 7 \leq 12$	<input type="checkbox"/>

This is an expression

(1)

(Total for Question 18 is 4 marks)

19 Here are the ingredients needed to make 16 biscuits.

<p style="text-align: center;"><b>Biscuits</b></p> <p style="text-align: center;">Ingredients to make <b>16</b> biscuits</p> <p style="text-align: center;">175 g of butter 75 g of sugar 250 g of flour</p>
--

Anna has

500 g of butter  
300 g of sugar  
625 g of flour

Work out the greatest number of biscuits Anna can make.

Dividing the amount of ingredients she has by the amount of each ingredient needed to make 16 works out how many lots of the 16 biscuits can be made. One of the ingredients will have less lots than the others and this is the limiting factor. Work out this many lot of 16 to work out how many biscuits can be made

(Total for Question 19 is 3 marks)

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20 An estimate of the height,  $H$  metres, of a tall building can be found using the formula

$$H = 4f + 12$$

where the building is  $f$  floors high.

A tall building is 110 floors high.

The real height of the building is 442 m.

Seb uses the formula to find an estimate of the height of this building.

He then finds the difference between his estimate and the real height.

Show that this difference is less than 5% of the real height.

Substituting 110 for  $f$  in the formula works out the estimate of the height of the building. Subtracting the real height works out the difference. Putting this as a fraction of the real height then multiplying by 100 converts it into a percentage difference

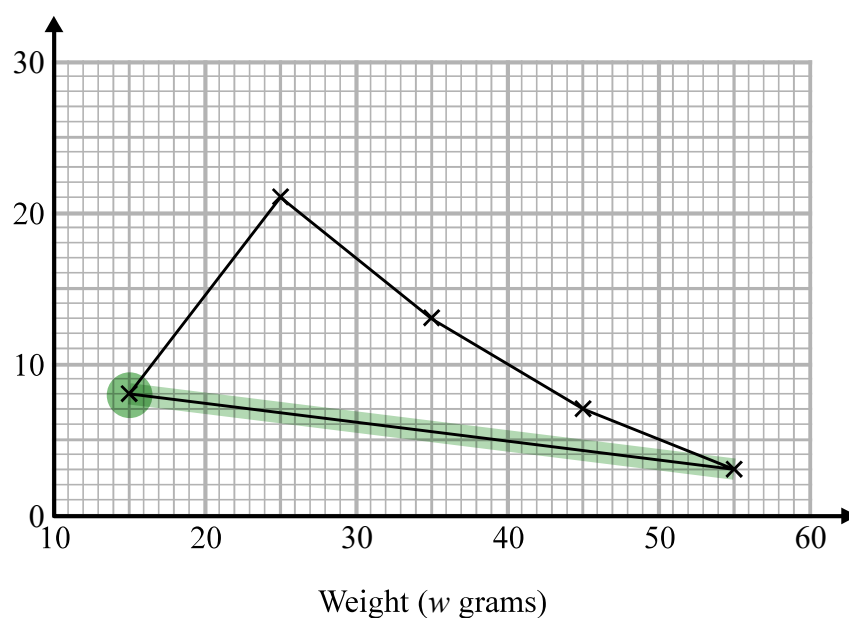
(Total for Question 20 is 4 marks)



21 The table shows some information about the weights of 50 potatoes.

Weight ( $w$ grams)	Frequency
$10 < w \leq 20$	6
$20 < w \leq 30$	21
$30 < w \leq 40$	13
$40 < w \leq 50$	7
$50 < w \leq 60$	3

Iveta drew this frequency polygon for the information in the table. The frequency polygon is **not** fully correct.



Write down **two** things that are wrong with the frequency polygon.

- 1.....
- .....
- 2.....
- .....

(Total for Question 21 is 2 marks)

22 The length of a pencil is 128 mm correct to the nearest millimetre.

Complete the error interval for the length of the pencil.

Adding and subtracting half of the resolution (what it is to the nearest) works out the upper and lower bound of the measurement

..... mm  $\leq$  length < ..... mm

(Total for Question 22 is 2 marks)

23 Tom and Adam have a total of 240 stamps.

The ratio of the number of Tom's stamps to the number of Adam's stamps is 3 : 7

Tom buys some stamps from Adam.

The ratio of the number of Tom's stamps to the number of Adam's stamps is now 3 : 5

How many stamps does Tom buy from Adam?

You must show all your working.

Work out the fraction of the stamps which Tom had then do this fraction of the 240 stamps to work out how many stamps he had. Then work out the fraction of the stamps which Tom now has and do this fraction of the 240 stamps to work out how many stamps he now has. Subtracting the number of stamps he had from the number he now has works out the difference and therefore how many he must have bought from Adam

.....  
(Total for Question 23 is 4 marks)

- 24 Each person in a fitness club is going to get a free gift.  
Stan is going to order the gifts.

Stan takes a sample of 50 people in the fitness club.  
He asks each person to tell him the gift they would like.

The table shows information about his results.

Gift	Number of people
sports bag	17
gym towel	7
headphones	11
voucher	15

There are 700 people in the fitness club.

- (i) Work out how many sports bags Stan should order.

17/50 is the fraction of the sample which chose sports bag so he should order this fraction of the 700 people

.....  
(2)

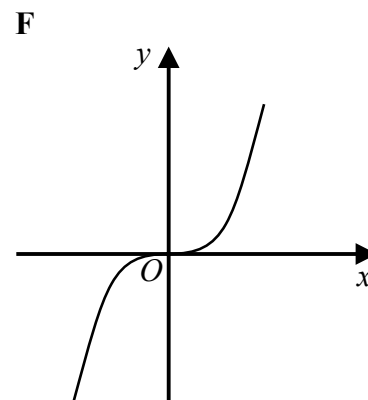
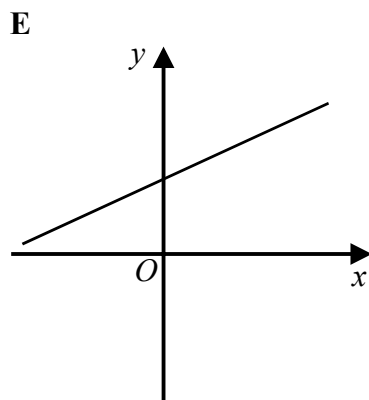
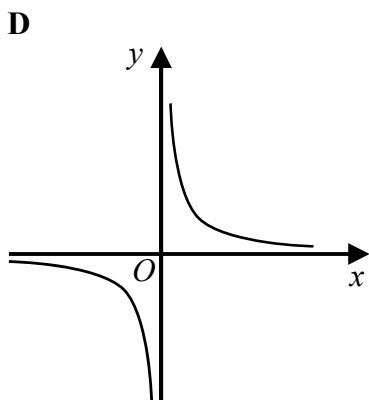
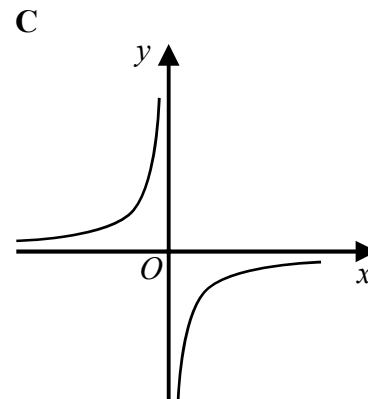
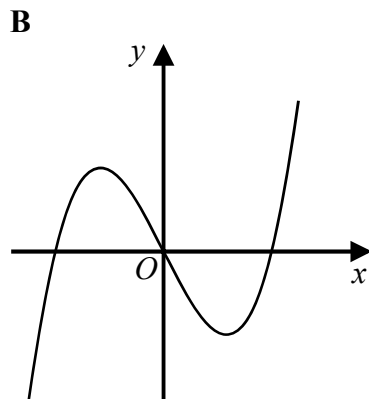
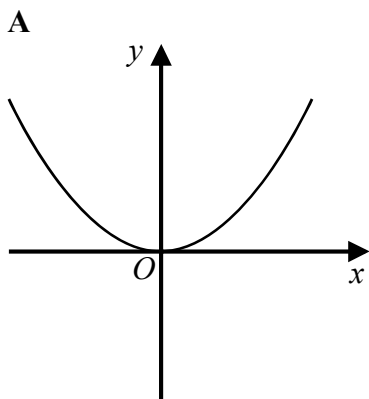
- (ii) Write down any assumption you made **and** explain how this could affect your answer.

.....  
An assumption is something taken as fact which might not actually be a fact. Is the 17/50 of the people in the sample necessarily the same of the fraction of the 700 people who want a sports bag?  
.....  
.....

.....  
(1)

(Total for Question 24 is 3 marks)

25 Here are six graphs.



Write down the letter of the graph that could have the equation

(a)  $y = x^3$

Using table mode, enter  $f(x) = x^3$ . Start: -5. End: 5. Step 1

(1)

(b)  $y = \frac{1}{x}$

Using table mode, enter  $f(x) = 1/x$ . Start: -5. End: 5. Step 1

(1)

(Total for Question 25 is 2 marks)

These give a table of values for each equation and can be compared to the six graphs

26 The  $n$ th term of a sequence is  $2n^2 - 1$

The  $n$ th term of a different sequence is  $40 - n^2$

Show that there is only one number that is in both of these sequences.

Using table mode, enter  $f(x) = 2x^2 - 1$  and  $g(x) = 40 - x^2$ . Start: 1. End: 30. Step: 1

This lists out both sequences up to the 30th term. As one of the sequences is increasing and the other is decreasing, we only need to list out the sequences for the parts in which they overlap

(Total for Question 26 is 3 marks)

27 Work out  $(3.42 \times 10^{-7}) \div (7.5 \times 10^{-6})$   
Give your answer in standard form.

Typing into the calculator give a decimal

Standard form is  $a \times 10^n$ , where  $1 \leq a < 10$  and  $n$  is an integer

(Total for Question 27 is 2 marks)

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28 The number of days,  $d$ , that it will take to build a house is given by

$$d = \frac{720}{n}$$

where  $n$  is the number of workers used each day.

Ali's company will take 40 days to build the house.

Hayley's company will take 30 days to build the house.

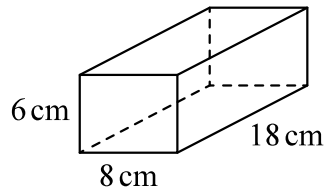
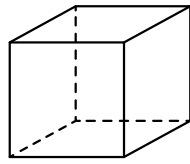
Hayley's company will have to use more workers each day than Ali's company.

How many more?

Rearrange the equation to make  $n$  the subject so that the number of workers can be worked out. Then substituting in the number of days needed to build the house for  $d$  will work out  $n$ , the number of workers needed. Subtracting the number of workers Ali's company will have to use from the number of workers Hayley's company will have to use works out the difference and therefore how many more workers Hayley's company uses

.....  
(Total for Question 28 is 3 marks)

29 The diagram shows a cube and a cuboid.



The total surface area of the cube is equal to the total surface area of the cuboid.

Janet says,

“The volume of the cube is equal to the volume of the cuboid.”

Is Janet correct?

You must show how you get your answer.

Volume of cuboid = length  $\times$  width  $\times$  height. Volume of cube = length<sup>3</sup>. The length of the sides on the cube is found by square rooting the area of one of the square faces. The area of one of the square faces is found by dividing the total surface area of the cube by 6 as there are 6 identical square faces. The surface area of the cube is the same as the surface area of the cuboid and this is found by adding together the areas of all of the faces on the cuboid. Area of rectangle = length  $\times$  width. Opposite faces on a cuboid are the same

(Total for Question 29 is 5 marks)

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30 Here are two column vectors.

$$\mathbf{a} = \begin{pmatrix} 5 \\ 2 \end{pmatrix}$$

$$\mathbf{b} = \begin{pmatrix} 3 \\ -1 \end{pmatrix}$$

x component of the vector b

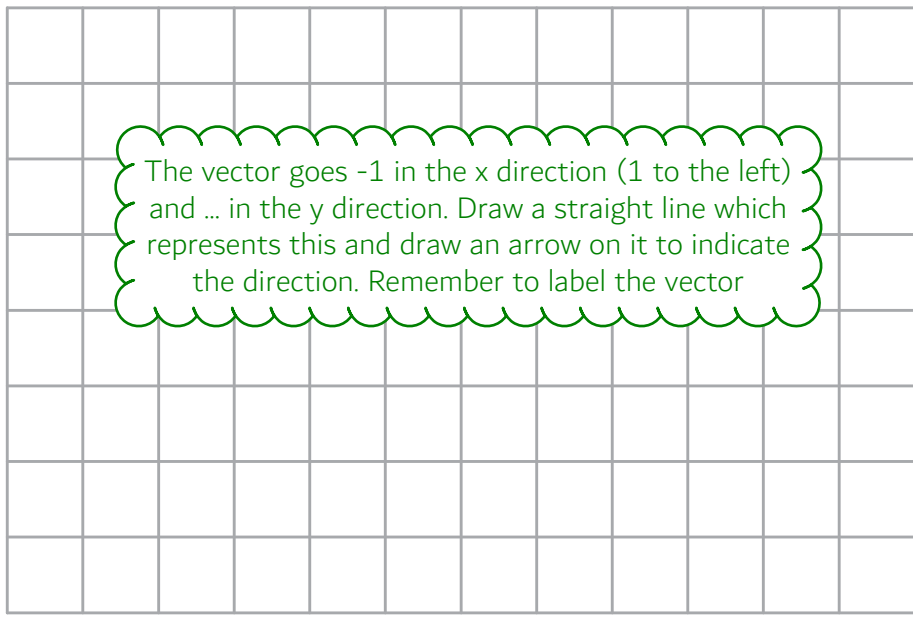
y component of the vector b

On the grid below, draw and label the vector  $\mathbf{a} - 2\mathbf{b}$

$$5 - 2 \times 3 = -1$$

Working out the x component of the vector

Work out the y component of the vector



(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS