

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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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

negative numbers      0      positive numbers

-7   -4   -2   1   8

(Total for Question 1 is 1 mark)

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

3 < 5 so round down

8375 → 8000

8000

(Total for Question 2 is 1 mark)

- 3 Write 0.23 as a percentage.

$$0.23 = \frac{23}{100} = 23\%$$

$$1\% = 0.01 = \frac{1}{100}$$

23 %

(Total for Question 3 is 1 mark)

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

$$\sqrt{17.64} = 4.2$$

4.2

(Total for Question 4 is 1 mark)

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5 Find the value of  $6^5$

type into calculator  
 OR  
 work out  $6 \times 6 \times 6 \times 6 \times 6$

= 7776

7776

(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?

total seats = 14 rows of 15 seats  
 =  $14 \times 15$   
 = 210 seats

if all tickets were sold: *number of seats X price per seat*  
 $210 \times £6.50 = £1365$

value of tickets NOT sold: *possible profit - actual profit*  
 $£1365 - £1274 = £91$

number of tickets NOT sold: 14 tickets  
 $£91 \div £6.50 = 14$  tickets

(Total for Question 6 is 3 marks)



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

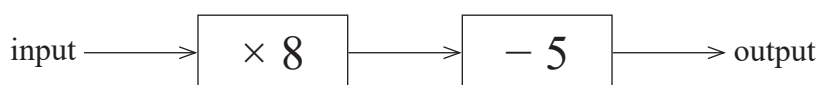
What fraction of the 20 sweets does Harry have now?

Harry has  $20 - 7 = 13$  sweets  
He has 13 left out of 20 =  $\frac{13}{20}$

$\frac{13}{20}$

(Total for Question 7 is 2 marks)

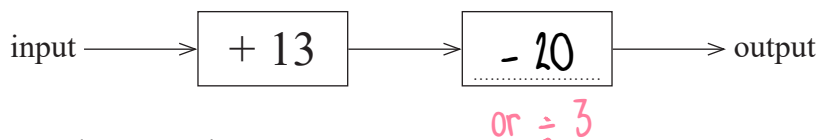
- 8 Here is a number machine.



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

$6 \longrightarrow 6 \times 8 = 48 \longrightarrow 48 - 5 = 43 \longrightarrow$   $\frac{43}{(1)}$

Here is a different number machine.



When the input is 17, the output is 10

- (b) Complete the number machine.

$17 \longrightarrow 17 + 13 = 30 \longrightarrow \frac{30 - ? = 10}{\text{or } \div 3} \longrightarrow 10$   
To get from 30 to 10, we -20.  $\frac{1}{(1)}$

(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. *The median is the MIDDLE value.*

Order the list: 3 4 4 6 8 9

There are 6 values so the middle is between the 4th and 5th values.

Half way between 4 and 6 is 5.

$$\frac{5}{(2)}$$

Aisha picks at random one of the numbers.

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

There are 2 odd numbers (3 and 9) out of 6 possible choices.

Probability =  $\frac{2}{6}$  (OR  $\frac{1}{3}$ )

$$\frac{2}{6} \text{ (OR } \frac{1}{3} \text{)}$$

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

*Mode = most common number*

The mean of the five numbers is 5

*Mean = overall average*

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

Mode is 3 so two or more cards must show a 3.

? = 3

Mean is 5:

$$\frac{3 + 3 + 8 + 5 + ?}{5} = 5$$

*x5* ( ) *x5*

$$3 + 3 + 8 + 5 + ? = 25$$

$$19 + ? = 25$$

$$? = 6$$

$$\frac{3}{(2)}, \frac{6}{(2)}$$

(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></p> <p style="text-align: center;">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?

$$8.40 \div 0.024 = 350 \text{ minutes}$$

$$350 \text{ minutes} = 5 \text{ hours (300 minutes)} + 50 \text{ minutes}$$

$$10:45 + 5 \text{ hours} = 15:45 \text{ (or 3:45pm)}$$

$$15:45 + 50 \text{ minutes} = 16:35 \text{ (or 4:35pm)}$$

$$\begin{aligned} 1 \text{ hour} &= 60 \text{ mins} \\ 60 \times 5 &= 300 \end{aligned}$$

$$\dots 16:35 \text{ (or 4:35pm)}$$

(Total for Question 10 is 3 marks)

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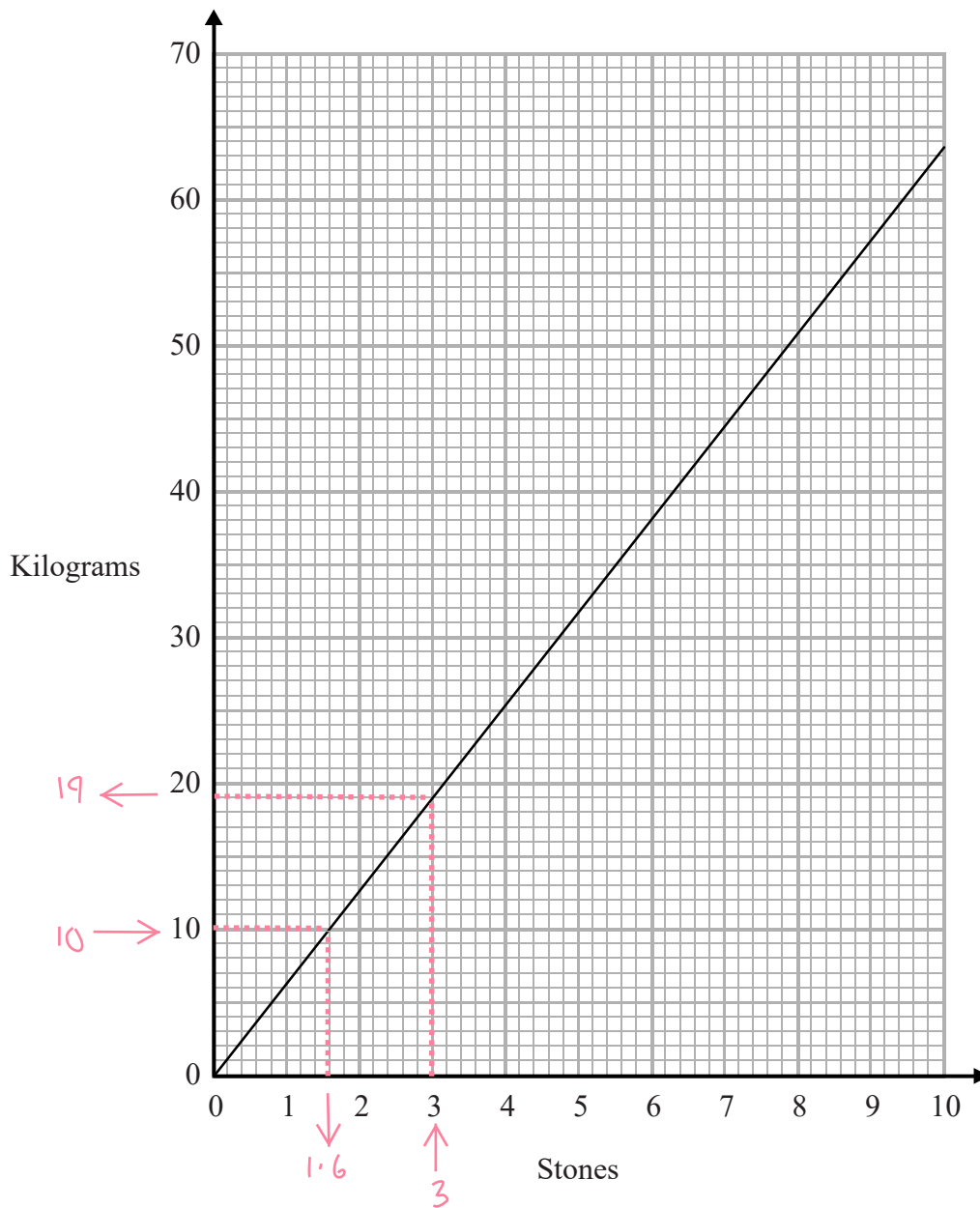


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11 You can use this graph to change between stones and kilograms.



(a) Change 3 stones to kilograms.

..... 19 ..... kilograms  
(1)

(b) Change 80 kilograms to stones.

10kg = 1.6 stone  
10 x 8 = 80 so 1.6 x 8 = 12.8 stone

..... 12.8 ..... stones  
(2)

(Total for Question 11 is 3 marks)



12 Find the number that is exactly halfway between  $\frac{1}{10}$  and  $\frac{3}{5}$  — denominator can be changed to 10

cannot be simplified  
as numerator is 1

$$\frac{3}{5} = \frac{6}{10}$$

$$\frac{1}{10} + \frac{6}{10} = \frac{7}{10}$$

$$\frac{7}{10} \div 2 = \frac{7}{20}$$

↑ finds halfway

$$\frac{7}{20}$$

(Total for Question 12 is 2 marks)

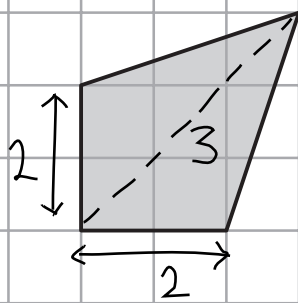
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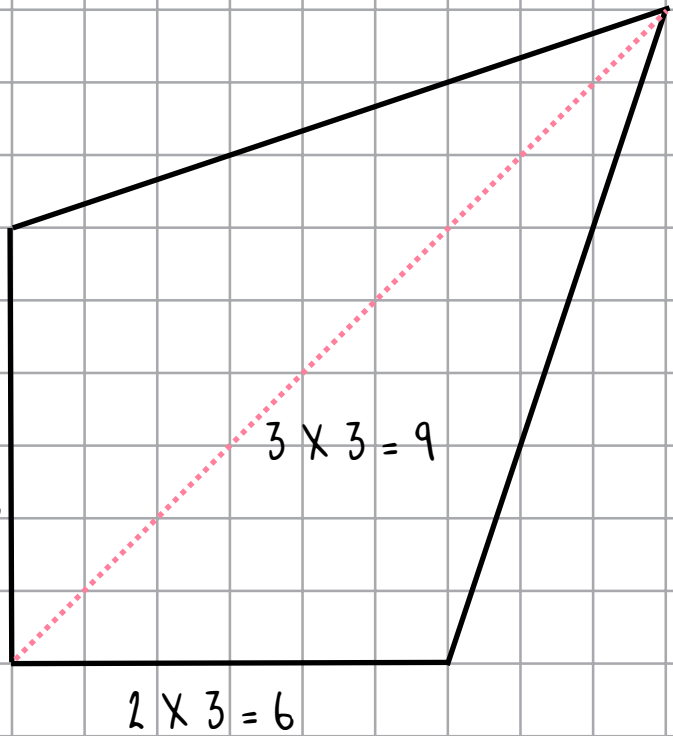
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$$2 \times 3 = 6$$



$$2 \times 3 = 6$$

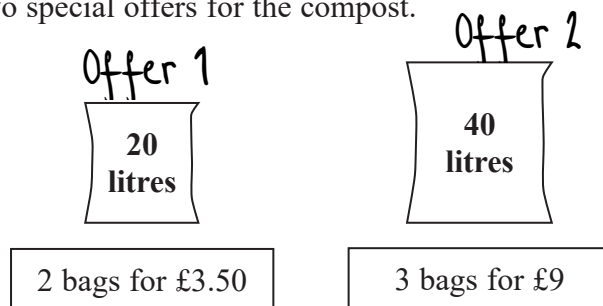
$$3 \times 3 = 9$$

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

(Total for Question 13 is 2 marks)



- 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.

Offer 1:

2 bags contains  $2 \times 20 = 40$  litres

2 bags costs £3.50

$3.50 \div 40 = \text{£}0.0875$  per litre    price  $\div$  amount = value

Offer 2:

3 bags contains  $3 \times 40 = 120$  litres

3 bags costs £9

$9 \div 120 = \text{£}0.075$  per litre    price  $\div$  amount = value

$0.0875 > 0.075$  therefore offer 2 (40 litres) is 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.

1 : 24 means that model size is  $\frac{1}{24}$  of actual size

$$19.2 \times \frac{1}{24} = 0.8 \text{ metres}$$

0.8 metres = 80 centimetres

$1 \text{ m} = 100 \text{ cm}$   
 $0.8 \times 100 = 80$

.....80..... 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.

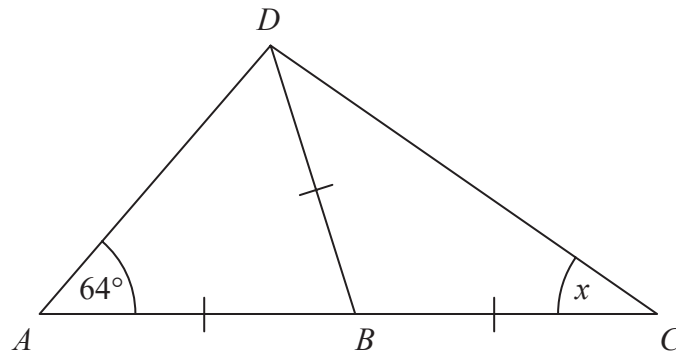
Work out the total amount of interest Maria gets by the end of the 3 years.

$$1.8\% = 1.8 \div 100 = 0.018$$
$$£4500 \times 3 \times 0.018 = £243 \text{ interest (extra money added)}$$

£.....243.....

(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.

$\hat{BDA} = \hat{BAD} = 64^\circ$       base angles in an isosceles triangle are equal

$\hat{BDC} = \hat{BCD} = x^\circ$       base angles in an isosceles triangle are equal

$128^\circ + 2x = 180^\circ$       total angles in a triangle sum to 180  
 $2x = 52^\circ$   
 $x = 26^\circ$

(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  $n$ .

$$\text{Ben} = n$$

Chloe is twice Ben so Chloe =  $2n$

Dan is five less than Ben so Dan =  $n - 5$

$$\begin{aligned} T &= \text{Ben} + \text{Chloe} + \text{Dan} \\ &= (n) + (2n) + (n - 5) \\ &= 4n - 5 \end{aligned}$$

$$\dots\dots\dots T = 4n - 5$$

(3)

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

An identity is an equation that will always be true, regardless of what values are substituted into it.

$3h + 2 = 14$	
$3a + 4b - 2c$	
$A = \pi r^2$	
$5m - 3m = 2m$	✓
$x + 7 \leq 12$	

This is always true:  
 $5m - 3m = 2m$   
 $2m = 2m$

(1)

(Total for Question 18 is 4 marks)



19 Here are the ingredients needed to make 16 biscuits.

Biscuits
Ingredients to make 16 biscuits
175 g of butter
75 g of sugar
250 g of flour

Anna has

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

Work out the greatest number of biscuits Anna can make.

$$500 \div 175 = 2.857.. \text{ times as much butter}$$

$$300 \div 75 = 4 \text{ times as much sugar}$$

$$625 \div 250 = 2.5 \text{ times as much flour}$$

2.5 is the smallest multiplier (the limiting multiplier) so this is the maximum we can multiply the number of biscuits by.

For example, if we try to make 3X as many biscuits, there will not be enough butter or sugar.

$$16 \times 2.5 = 40 \text{ biscuits}$$

40

(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.

Estimate:

$$H = 4f + 12$$

$$H = 4(110) + 12$$

$$H = 440 + 12$$

$$H = 452\text{m}$$

$5\% = 5 \text{ out of } 100 = \frac{5}{100}$

$$5\% \text{ of real height} = \frac{5}{100} \times 442 = 22.1\text{m}$$

$$\text{Difference in heights} = 452 - 442 = 10\text{m}$$

$10\text{m} < 22.1\text{m}$  therefore the difference is less than 5% of the real height.

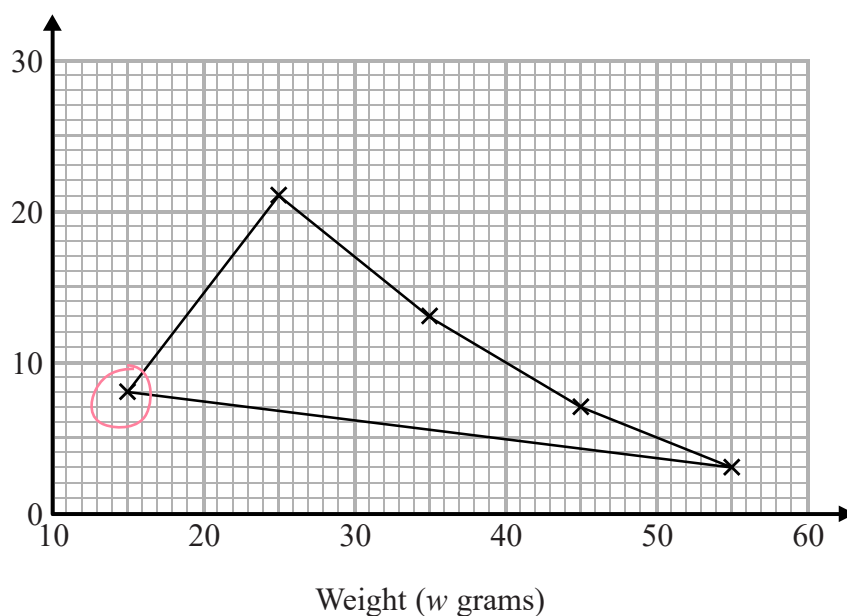
(Total for Question 20 is 4 marks)



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 The first and last points should not be connected.

2 The point at (15, 8) should be plotted at (15, 6).

(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.

Lower bound: 127.5 *Lowest value that rounds up to 128.*

Upper bound: 128.5 *Highest value that rounds down to 128.*

$$\dots\dots\dots 127.5 \text{ mm} \leq \text{length} < \dots\dots\dots 128.5 \text{ mm}$$

(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.

Before buying:

$$3 + 7 = 10 \text{ parts in total}$$

$$240 \div 10 = 24 \text{ stamps per part}$$

$$\text{Tom has 3 parts: } 3 \times 24 = 72 \text{ stamps}$$

$$\text{Adam has 7 parts: } 7 \times 24 = 168 \text{ stamps}$$

After buying:

$$3 + 5 = 8 \text{ parts in total}$$

$$240 \div 8 = 30 \text{ stamps per part}$$

$$\text{Tom has 3 parts: } 3 \times 30 = 90 \text{ stamps}$$

$$\text{Adam has 5 parts: } 5 \times 30 = 150 \text{ stamps}$$

$$\text{Adam has sold } 168 - 150 = 18 \text{ stamps}$$

..... 18 stamps

(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.

$\frac{17}{50}$  people want a sports bag  $\leftarrow 17 \text{ out of } 50 = 17 \div 50 = \frac{17}{50}$

$\frac{17}{50} \times 700 = 238$  sports bags

238

(2)

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

Sample is representative of the whole population, otherwise answer will be incorrect.

(1)

(Total for Question 24 is 3 marks)

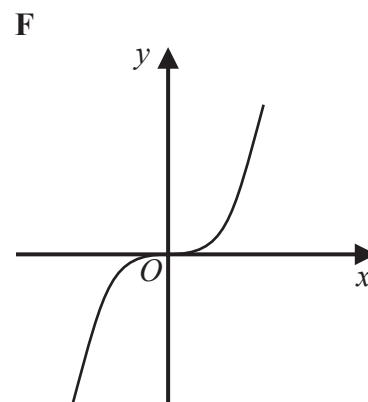
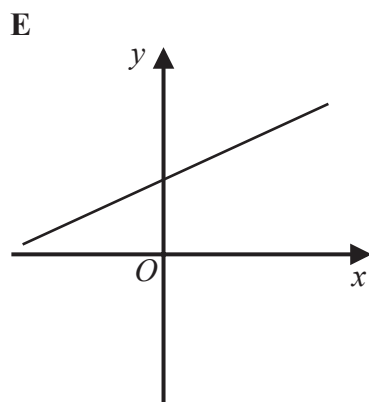
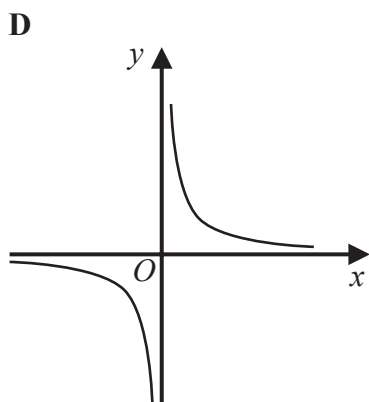
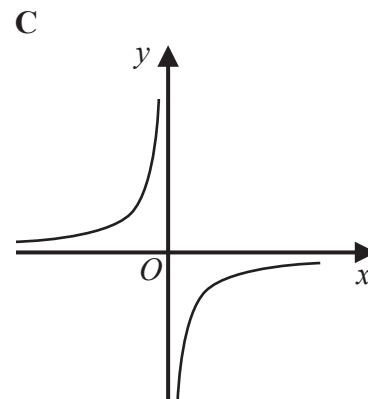
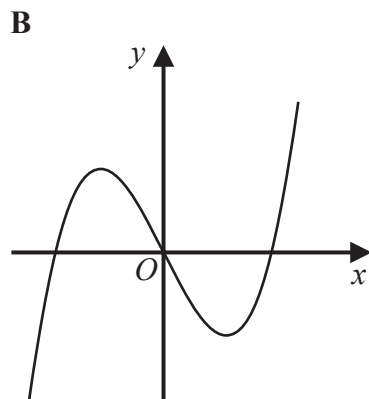
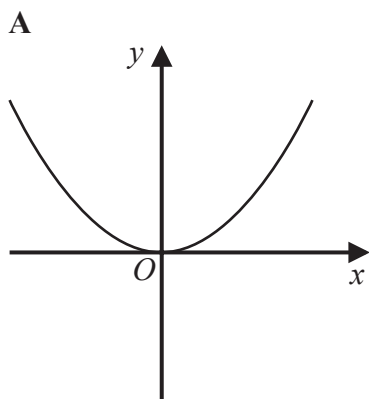


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25 Here are six graphs.



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

(a)  $y = x^3$

..... **F** .....  
(1)

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

..... **D** .....  
(1)

(Total for Question 25 is 2 marks)



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.

First sequence: 1 7 17 31 49

Second sequence: 39 36 31 24 15 4 -9

First sequence continues to increase and second sequence continues to decrease so there will be no further shared terms.

(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.

$$3.42 \times 10^{-7} = 0.000000342$$

$$7.5 \times 10^{-6} = 0.0000075$$

$$0.000000342 \div 0.0000075 = 0.0456$$

$$0.0456 = 4.56 \times 10^{-2}$$

$$4.56 \times 10^{-2}$$

(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?

Ali's Company:

$$\begin{array}{l}
 40 = \frac{720}{n} \\
 \times n \quad \quad \quad \times n \\
 \hline
 40n = 720 \\
 \div 40 \\
 \hline
 n = 18 \text{ workers}
 \end{array}$$

Hayley's Company:

$$\begin{array}{l}
 30 = \frac{720}{n} \\
 \times n \quad \quad \quad \times n \\
 \hline
 30n = 720 \\
 \div 30 \\
 \hline
 n = 24 \text{ workers}
 \end{array}$$

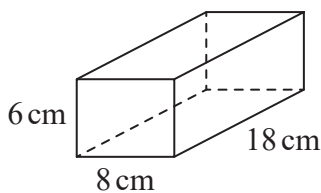
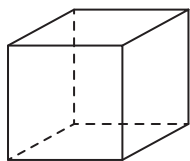
$$24 - 18 = 6 \text{ more workers}$$

6

(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 = height X width X depth  
S.A = total of all faces

Cuboid:

$$\text{S.A} = 2(\overset{\text{ends}}{6 \times 8}) + 2(\overset{\text{sides}}{6 \times 18}) + 2(\overset{\text{top/bottom}}{8 \times 18}) = 600\text{cm}^2$$

$$\text{Volume} = 6 \times 8 \times 18 = 864\text{cm}^3$$

$$\text{S.A of cuboid} = \text{S.A of cube} = 600\text{cm}^2$$

Cube:

length of one edge =  $x$  cm *all edges are same length*

$$\text{S.A} = 6(x \times x)$$

$$\begin{aligned} 600 &= 6x^2 \\ \div 6 & \left( \begin{array}{l} 100 = x^2 \\ \div 6 \end{array} \right) \\ 100 &= x^2 \\ \sqrt{\phantom{x}} & \left( \begin{array}{l} 10 = x \\ \sqrt{\phantom{x}} \end{array} \right) \end{aligned}$$

*has 6 faces*

$$\text{Volume} = 10 \times 10 \times 10 = 1000\text{cm}^3$$

$864 \neq 1000$  therefore they do not have the same volume; Janet is incorrect.

(Total for Question 29 is 5 marks)



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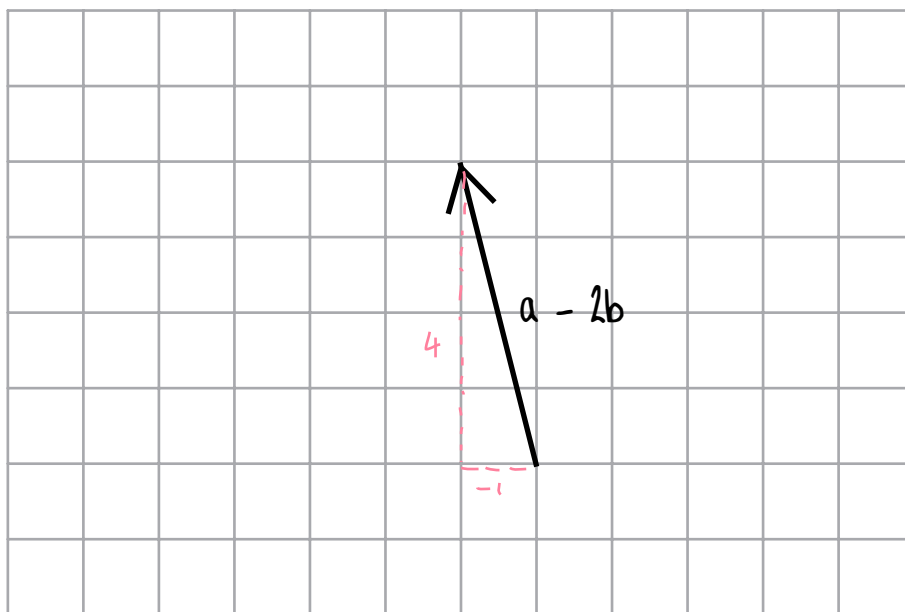
30 Here are two column vectors.

$$\mathbf{a} = \begin{pmatrix} 5 \\ 2 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} 3 \\ -1 \end{pmatrix}$$

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

$$\underline{\mathbf{a}} - 2\underline{\mathbf{b}} = \begin{pmatrix} 5 \\ 2 \end{pmatrix} - 2\begin{pmatrix} 3 \\ -1 \end{pmatrix} = \begin{pmatrix} 5 \\ 2 \end{pmatrix} - \begin{pmatrix} 2 \times 3 \\ 2 \times -1 \end{pmatrix} = \begin{pmatrix} 5 \\ 2 \end{pmatrix} - \begin{pmatrix} 6 \\ -2 \end{pmatrix} = \begin{pmatrix} 5-6 \\ 2-(-2) \end{pmatrix}$$

1 unit left =  $\begin{pmatrix} -1 \\ 0 \end{pmatrix}$   
4 units up



(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS



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