



Turn over

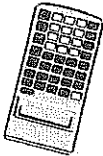
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Advice

- 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.

Information

- 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.



Instructions

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)	
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	

Worked
Solutions (11<)



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

-7, -4, -2, 1, 8

(Total for Question 1 is 1 mark)

2 Write the number 8375 correct to the nearest thousand.

8000

(Total for Question 2 is 1 mark)

3 Write 0.23 as a percentage.

23 %

(Total for Question 3 is 1 mark)

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

4.2

(Total for Question 4 is 1 mark)

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5 Find the value of 6^5

$$6 \times 6 \times 6 \times 6 \times 6$$

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?

$$14 \times 15 = 210$$

$$1274 \div 6.50 = 196$$

$$210 - 196 = 14$$

14

(Total for Question 6 is 3 marks)





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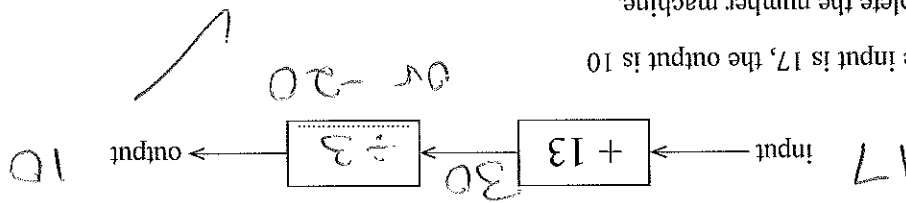
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(Total for Question 8 is 2 marks)

(1)

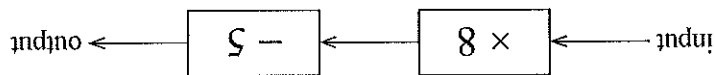
(b) Complete the number machine.

When the input is 17, the output is 10



Here is a different number machine.

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



8 Here is a number machine.

(Total for Question 7 is 2 marks)

Handwritten solution for Question 7:

$$20 - 7 = 13$$
$$\frac{13}{20}$$

What fraction of the 20 sweets does Harry have now?

He gives 7 of the sweets to Nadia.

7 Harry has 20 sweets.

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9 Here is a list of numbers.

6 4 9 8 4 3

(a) Work out the median.

3 4 4 6 8 9 ✓

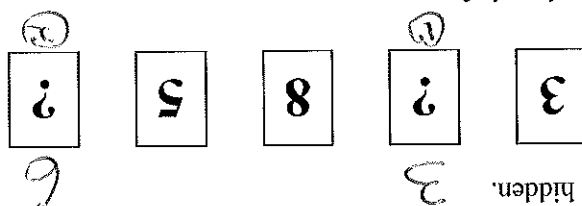
$$\frac{4+6}{2} = 5$$

Aisha picks at random one of the numbers.

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

$$\frac{\text{Number of odd numbers}}{\text{Total number of numbers}} = \frac{2}{6}$$

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.

$$?? \div 5 = 5$$

$$?? = 25$$

$$\therefore ?? = 31$$

$$3 + 3 + 8 + 5 = 19$$

$$25 - 19 = 6$$

(Total for Question 9 is 6 marks)

(2)

3 6

$$\frac{1}{3} \text{ or } \frac{2}{6}$$

(2)

5 ✓

Turn over



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

Car park

0.024 euros per minute

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?

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

$$350 \text{ minutes} = 5 \text{ hours } 50 \text{ minutes}$$

$$10.45 \text{ plus } 5 \text{ hours } 50 \text{ minutes}$$

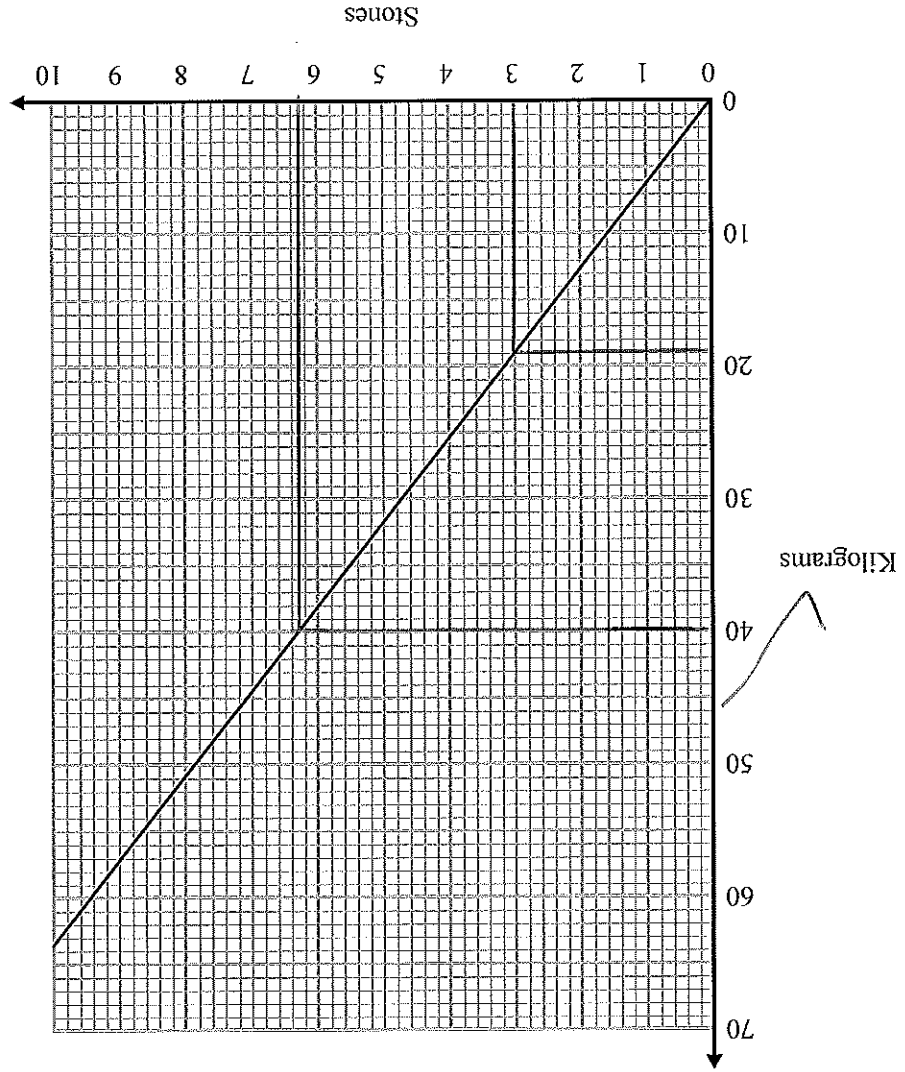
$$= 16.35 \checkmark$$

(Total for Question 10 is 3 marks)

accept
4.35pm



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



(a) Change 3 stones to kilograms.

(i) kilograms

19

(b) Change 80 kilograms to stones.

(ii) stones

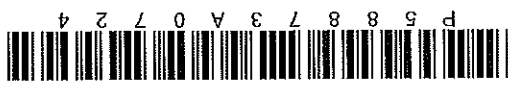
12.6

$$40 \text{ kg} = 6.3 \text{ stones}$$

$$80 \text{ kg} = 12.6 \text{ stones}$$

(Total for Question II is 3 marks)

(Accept 12.4 to 12.8)



Turn over



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

$$\frac{1}{10} \text{ and } \frac{6}{10}$$

$$\frac{1}{2} \text{ way} = \frac{3.5}{10}$$

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

accept
0.35
or equivalent

(Total for Question 12 is 2 marks)

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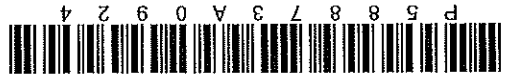
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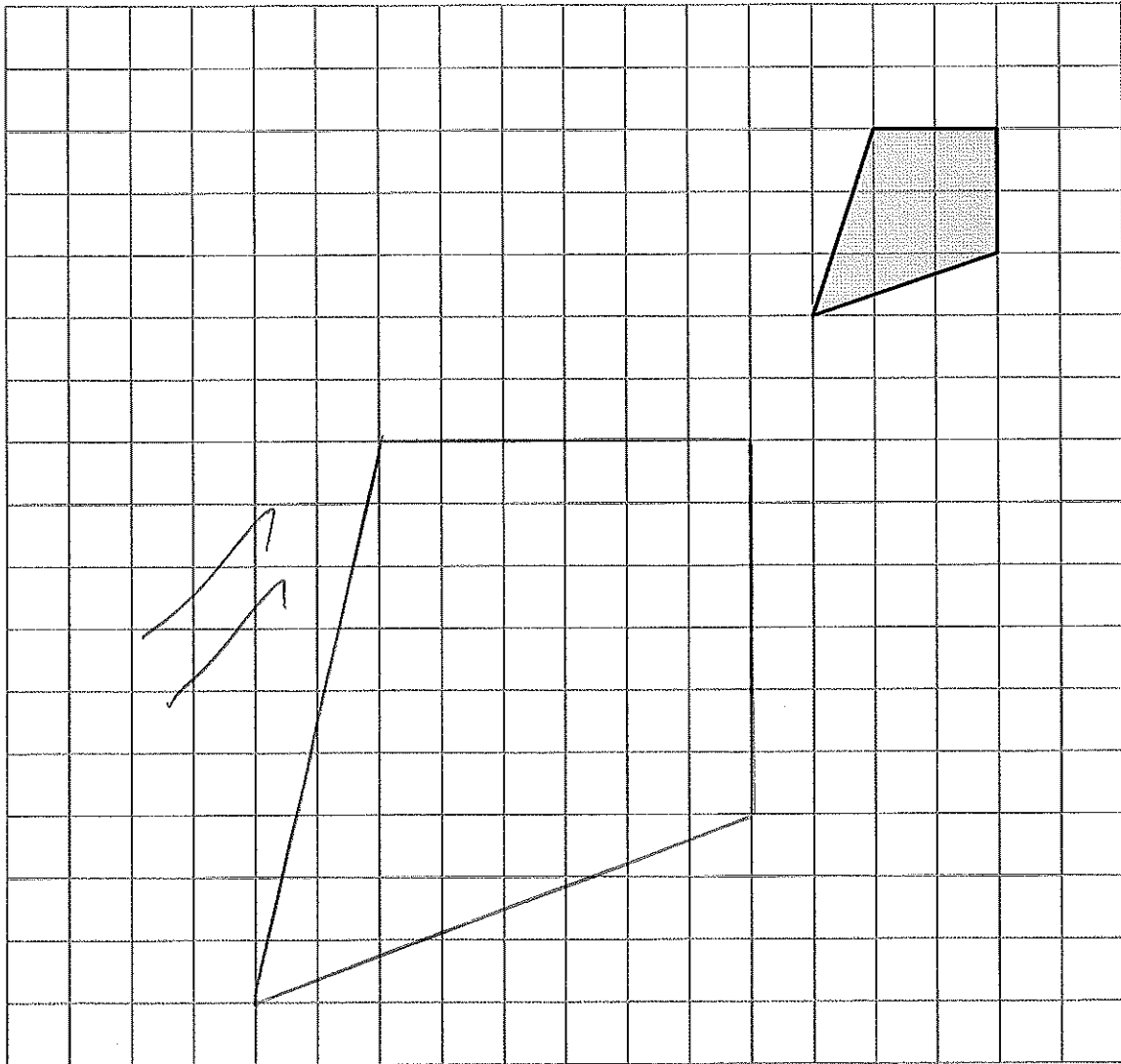
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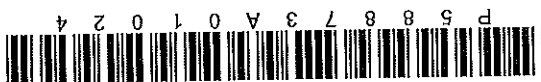


✓ Any 2 sides correct
or a correct enlargement
with scale factor not 1 or 3

(Total for Question 13 is 2 marks)

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





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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.

2 bags for £3.50

20
litres

3 bags for £9

40
litres

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

✓ 1st offer → $2 \times 20 = 40 \text{ litres}$
for £3.50

$40 \text{ litres} = 3 \times 3.50 = \underline{\underline{£10.50}}$

✓ 2nd offer → $3 \times 40 = 120 \text{ litres}$
for £9

✓ 2nd offer better value as £1.50

cheaper.

(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.

$$1 : 24$$

$$19.2m = 1920cm$$

$$1920 \div 24 = 80cm$$

(method)

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.

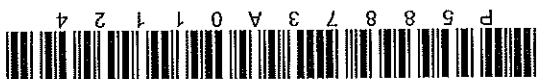
Work out the total amount of interest Maria gets by the end of the 3 years.

$$4500 \times 1.8\% = £81$$

$$£81 \times 3 = £243$$

$$£243$$

(Total for Question 16 is 2 marks)





(Total for Question 17 is 4 marks)

$$180 - 128 = 52^\circ$$

$$52^\circ \div 2 = 26^\circ = x$$

Isosceles triangle

$$180 - 52 = 128^\circ$$

Angles on a straight line = 180

②

$$180 - 128 = 52^\circ$$

Isosceles triangle

Angles in a triangle = 180

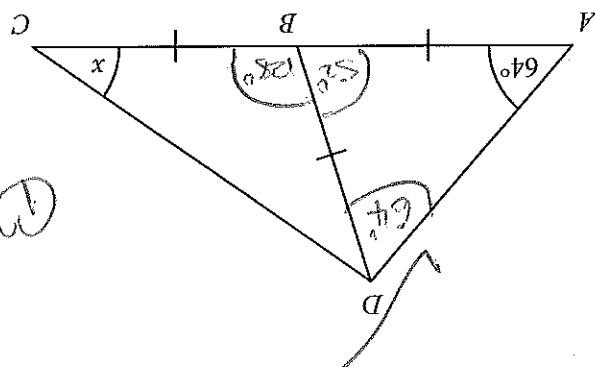
$$64 + 64 = 128^\circ$$

Work out the size of the angle marked x .
Give a reason for each stage of your working.

Angle $DAB = 64^\circ$

$AB = BC = BD$.

ABC is a straight line.



① Base angles of an isosceles triangle are equal

for two reasons
① and ②

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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 .

Handwritten work for part (a):

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

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

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

(1)

(Total for Question 18 is 4 marks)





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(Total for Question 19 is 3 marks)

Butter $500 \div 175 = 2.857$ ✓

Sugar $300 \div 75 = 4$ ✓

Flour $625 \div 250 = 2.5$

2.5 lots of 16

$2.5 \times 16 = 40$ ✓

40 ✓

Work out the greatest number of biscuits Anna can make.

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

Ingredients to make 16 biscuits

Biscuits

175 g of butter
75 g of sugar
250 g of flour

19 Here are the ingredients needed to make 16 biscuits.

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.

$$H = 48 + 12$$

$$H = 4 \times 110 + 12$$

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

$$\text{Real height} = 442 \text{ m}$$

$$\% \text{ difference} = \frac{452 - 442}{442} \times 100 = 2.26\%$$

Yes it is less than 5% (Total for Question 20 is 4 marks)

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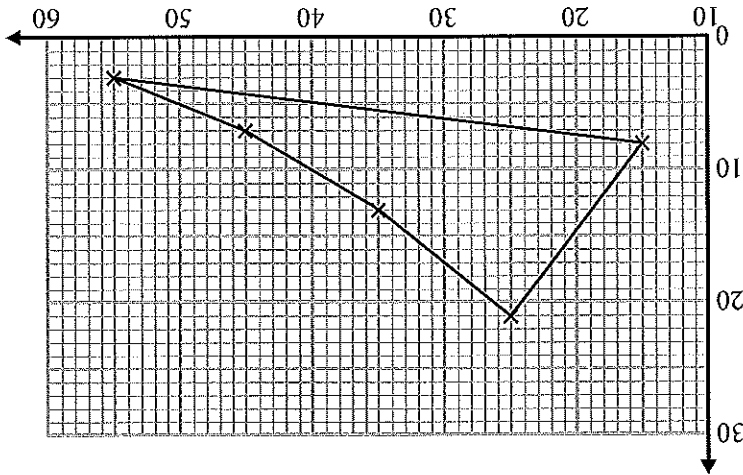
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21 The table shows some information about the weights of 50 potatoes.

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.

- There is no Frequency Label
- The polygon should not be closed
- The y axis is not labelled
- The first and last points should not be connected. (Total for Question 21 is 2 marks)
- The point (15, 6) has been plotted incorrectly (at 15, 8)



for one correct answer

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

Complete the error interval for the length of the pencil.

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

(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

TA

$$3 + 7 = 10$$

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

TA

$$3 + 5 = 8$$

You must show all your working.

$$240 \div 10 = 24$$

$$3 \times 24 = 72$$

Tom's stamps
before buying

$$240 \div 8 = 30$$

$$3 \times 30 = 90$$

Tom's stamps
after buying

$$90 - 72 = 18$$

(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.

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.

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

238

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

The sample represents the people. The sample is a random sample.

otherwise the answer will be

wrong / inaccurate

(Total for Question 24 is 3 marks)

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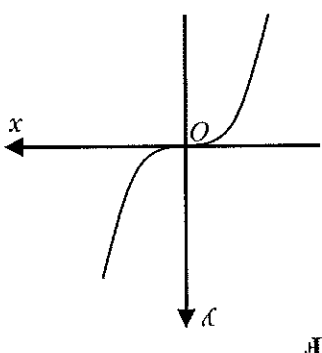
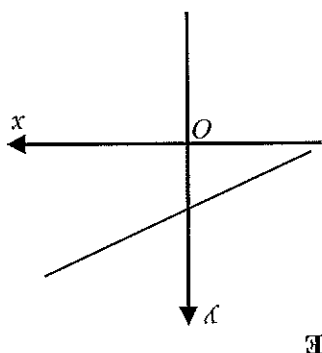
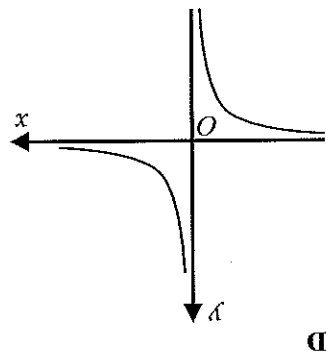
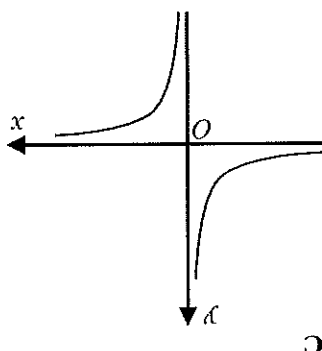
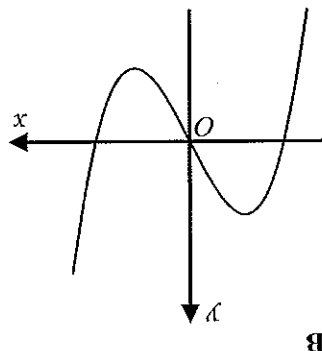
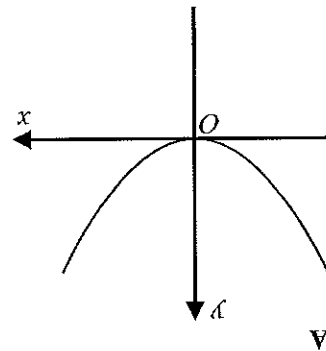
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25 Here are six graphs.



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

(a) $y = x^3$

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

f

D

(Total for Question 25 is 2 marks)



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



27 Work out $(3.42 \times 10^{-7}) \div (7.5 \times 10^{-9})$.
Give your answer in standard form.

$$3.42 \div 7.5 = 0.456$$

$$10^{-7} \div 10^{-6} = 10^{-1}$$

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

(Total for Question 27 is 2 marks)

(Total for Question 26 is 3 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.

$$2n^2 - 1 = 1, 7, 17, 31, 49, \dots$$

$$40 - n^2 = 39, 36, 31, 24, 15, \dots$$

31 is the only number

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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.

All'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 All's company.

How many more?

$$All \quad d = \frac{720}{40} = 18 \text{ workers}$$

$$Hayley \quad d = \frac{720}{30} = 24 \text{ workers}$$

$$24 - 18 = 6$$

(Total for Question 28 is 3 marks)

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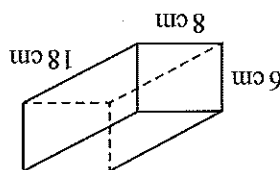
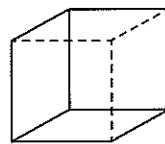
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29 The diagram shows a cube and a cuboid.



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.

Surface area of cuboid

$$6 \times 8 = 48$$

$$8 \times 18 = 108$$

$$6 \times 18 = 144$$

$$\frac{300 \text{ cm}^2}{2} \times 2 = 600 \text{ cm}^2$$

✓ 3 faces area

$$\text{Cuboid} \rightarrow 600 \div 6 = 100 \text{ cm}^2$$

$$\text{One side} \rightarrow \sqrt{100} = 10 \text{ cm}$$

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

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

(Total for Question 29 is 5 marks)



Volumes are different so Janet is wrong

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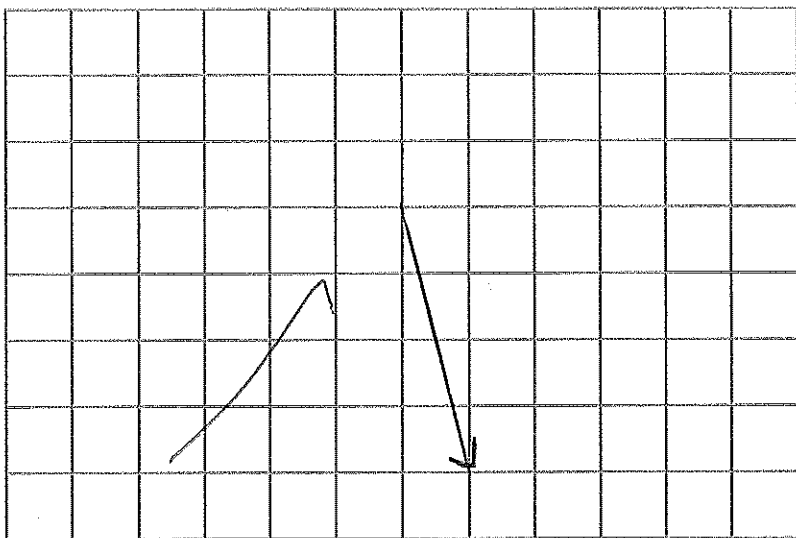
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30 Here are two column vectors.

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

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



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

$$\mathbf{a} - 2\mathbf{b} = \begin{pmatrix} 5 - 6 \\ 2 - (-2) \end{pmatrix} = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$$

TOTAL FOR PAPER IS 80 MARKS

(Total for Question 30 is 3 marks)





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