

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

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

- 1 Write these numbers in order of size.
Start with the smallest number.

$$\cancel{8} \quad \cancel{4} \quad \cancel{1} \quad \cancel{7} \quad \cancel{2}$$

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

$$\underline{-7, -4, -2, 1, 8} \quad \textcircled{1}$$

(Total for Question 1 is 1 mark)

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

$$8 \mathbf{3} 75 \quad \text{less than 5 so we round down}$$

$$\underline{8000} \quad \textcircled{1}$$

(Total for Question 2 is 1 mark)

- 3 Write 0.23 as a percentage.

$$\frac{0.23}{1} \xrightarrow{\times 100} \frac{23}{100} = 23\% \quad \textcircled{1}$$

..... %

(Total for Question 3 is 1 mark)

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

$$\sqrt{17.64} = \frac{21}{5} = 4.2$$

use calculator

$$\underline{4.2} \quad \textcircled{1}$$

(Total for Question 4 is 1 mark)

5 Find the value of 6^5

$$6^5 = 6 \times 6 \times 6 \times 6 \times 6 = 7776 \text{ ①}$$

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?

$$\text{① } 14 \times 15 = 210 \text{ Seats in cinema}$$

$$210 \times 6.50 = \pounds 1365 \leftarrow \text{If all tickets sold}$$

$$\text{① } 1365 - 1274 = \pounds 91 \leftarrow \text{Difference between how many tickets were sold and how many could have been sold}$$

$$91 \div 6.50 = 14 \text{ tickets}$$

Number of tickets not sold

① 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?

Total: 20 sweets

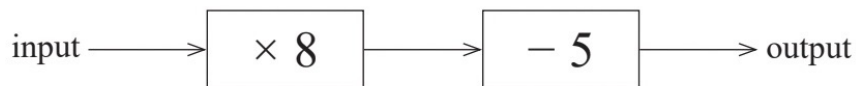
Harry has left: $20 - 7 = 13$ sweets

$\frac{13}{20}$

$$\frac{13}{20}$$

(Total for Question 7 is 2 marks)

- 8 Here is a number machine.



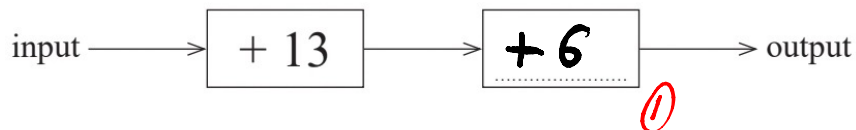
- (a) Work out the output when the input is 6

$$(6 \times 8) - 5 = 48 - 5 = 43$$

$$43$$

(1)

Here is a different number machine.



When the input is 17, the output is 10

- (b) Complete the number machine.

$$(17 + 13) \boxed{?} = 10 \Rightarrow 4 \boxed{+ 6} = 10$$

(1)

9 Here is a list of numbers.

~~3~~ ~~4~~ ~~8~~ ~~9~~ ~~4~~ ~~3~~

(a) Work out the median.

~~3~~, ~~4~~, ~~4~~, ~~6~~, ~~8~~, ~~9~~ ①

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

5 ①

(2)

Aisha picks at random one of the numbers.

6, 4, 8, 9, 4, 3

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

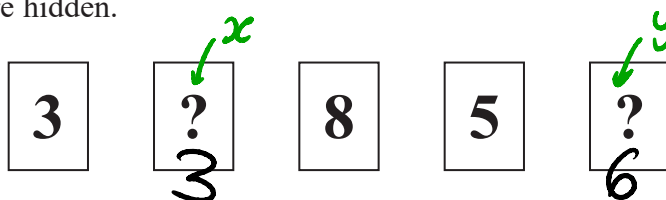
Total 6 numbers
2 of the numbers are odd

$$\frac{2}{6}$$

(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.

Since mode is 3 at least one of the hidden cards must be 3
So lets say card x is 3

Mean

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

$$\frac{19+y}{5} = 5 \times 5 \quad \text{①}$$

$$19+y = 25$$

$$\begin{array}{r} 19+y = 25 \\ -19 \quad -19 \\ \hline y = 6 \end{array}$$

3, 6

(2)

(Total for Question 9 is 6 marks)

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

<p>Car park</p> <p>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?

How many minutes is 8.40 euros?

$$\frac{8.40}{0.024} = 350 \text{ minutes} \quad (1)$$

10:45 + 350 minutes

11:00 + 335 minutes

11:00 + 5 hrs 35 mins

$$350 - 15 = 335 \quad (1)$$

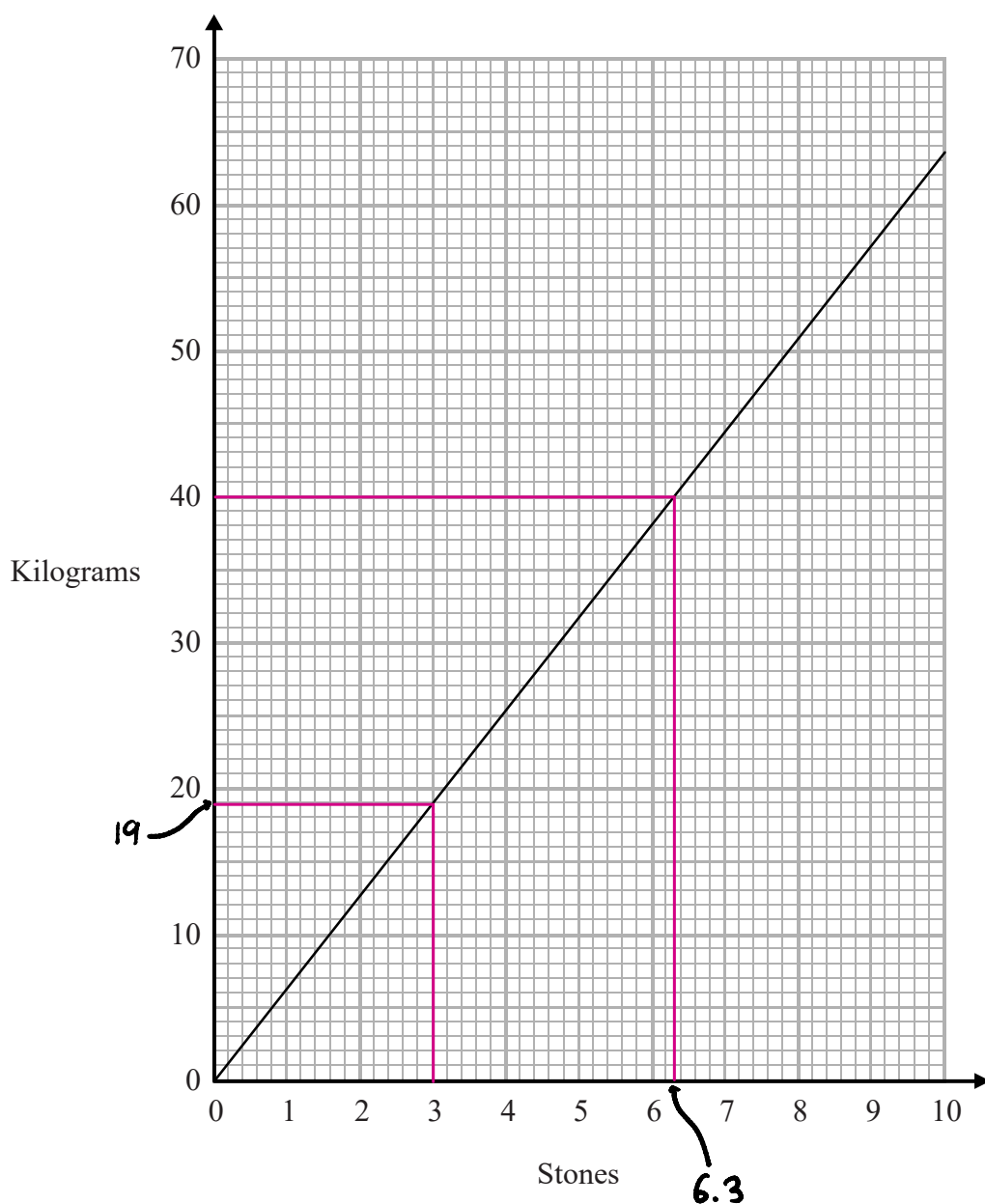
$$\frac{335}{60} = 5.58\bar{3} \text{ hours}$$

$$335 - (5 \times 60)$$

16:00 + 35 minutes

16:35 (1)

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



(a) Change 3 stones to kilograms.

..... 19 ^① kilograms
(1)

(b) Change 80 kilograms to stones.

$80 \div 2 = 40$ $\times 2$ \downarrow $40 \text{ kg} = 6.3 \text{ stones}$ ^①
 $80 \text{ kg} = 12.6 \text{ stones}$ $\downarrow \times 2$ ^①

..... 12.6 stones
(2)

(Total for Question 11 is 3 marks)



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

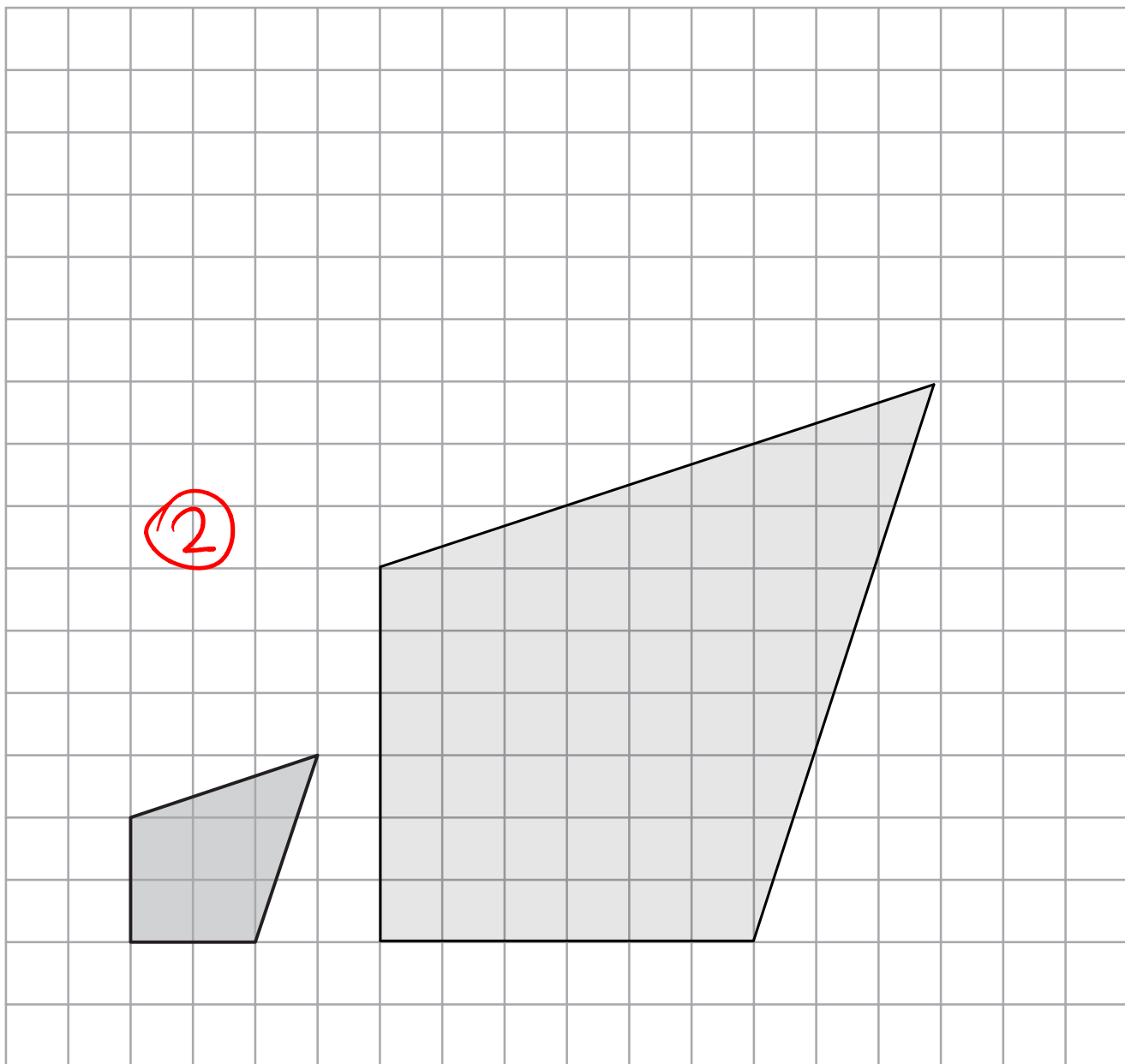
$$\left(\frac{1}{10} + \frac{3}{5}\right) \div 2 = \frac{7}{10} \div 2 = \frac{7}{20} = 0.35$$

①

$$\frac{7}{20} \text{ ①}$$

(Total for Question 12 is 2 marks)

13



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

(Total for Question 13 is 2 marks)

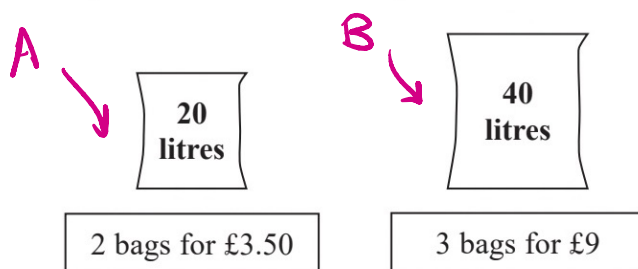
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- 14 A shop sells compost in 20 litre bags and in 40 litre bags.
One day the shop had two special offers for the compost.



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

Work out how much 1 litre is worth in each deal

A 20l each **B** 40l each

2 bags = £3.50 3 bags = £9

$(2 \times 20l) = £3.50$ $(3 \times 40l) = £9$

$40l = £3.50$ $120l = £9$

$\div 40 \downarrow$ $1l = £0.0875$ $\div 120 \downarrow$ $1l = £0.075$ ②

$0.075 < 0.0875$ so 3 40l bags for £9 is
better value for money ①

(Total for Question 14 is 3 marks)

- 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.

$$1 \text{ m} = 100 \text{ cm}$$

$$\begin{array}{l} \times 19.2 \downarrow \\ 19.2 \text{ m} = 1920 \text{ cm} \end{array} \quad \textcircled{1}$$

$$\frac{1920}{24} = 80 \text{ cm} \quad \textcircled{1}$$

80^①

..... 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.

$$\begin{array}{l} \pounds 4500 \times 1.8\% \\ \pounds 4500 \times 0.018 \\ = \pounds 81 \end{array} \quad \begin{array}{l} \text{convert \%} \\ \text{to decimal by} \\ \div 100 \end{array} \quad \frac{1.8}{100} = 0.018 \quad \textcircled{1}$$

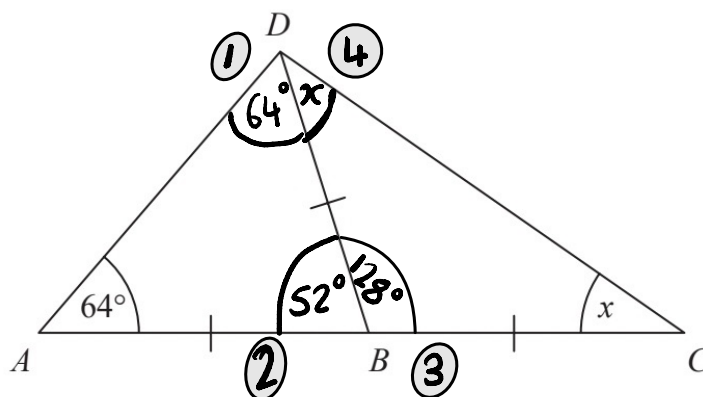
Each year get £81 in interest

$$\pounds 81 \times 3 = \pounds 243$$

£ 243^①

(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.

- ① base angles of isosceles triangle are equal ①
- ② $180 - 64 - 64 = 52^\circ$ Since sum of angles in triangle = 180° ①
- ③ $180 - 52 = 128^\circ$ Since sum of angles on straight line = 180° ①
- ④ $x + x + 128 = 180$ Since base angles in isosceles triangle are equal and sum of angles in triangle = 180° ①
 $2x + 128 = 180$
 $2x = 52$
 $x = 26^\circ$

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 .Ben is n years oldChloe is $2n$ years oldDan is $n-5$ years old

$$n + 2n + n - 5 = T$$

$$4n - 5 = T$$

①

②

$$T = 4n - 5$$

(3)

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

$3h + 2 = 14$	
$3a + 4b - 2c$	
$A = \pi r^2$	
$5m - 3m = 2m$	① ✓
$x + 7 \leq 12$	

An equation which is always true no matter what values are substituted

(1)

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

For 1 biscuit

$$\frac{175}{16} \text{ g butter}$$

$$\frac{75}{16} \text{ g sugar}$$

$$\frac{250}{16} \text{ g flour}$$

Anna has

500 g of butter

300 g of sugar

625 g of flour

Work out the greatest number of biscuits Anna can make.

Butter: $500 \div \left[\frac{175}{16} \right] = 45.714 = 45$ whole biscuits

Sugar: $300 \div \left[\frac{75}{16} \right] = 64$ whole biscuits (2)

Flour: $625 \div \left[\frac{250}{16} \right] = 40$ whole biscuits

We're limited by ingredient that can make the least biscuits so Anna can make 40 biscuits (1)

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.

$$H = 4(110) + 12 \quad (1)$$

$$H = 452 \text{ m} \quad (1)$$

← Seb's estimate

$$442 \times 1.05 = 464.1$$

↑ Increase
by 5% (1)

Since $452 < 464.1$ the difference is less than 5% of the real height (1)

(Total for Question 20 is 4 marks)



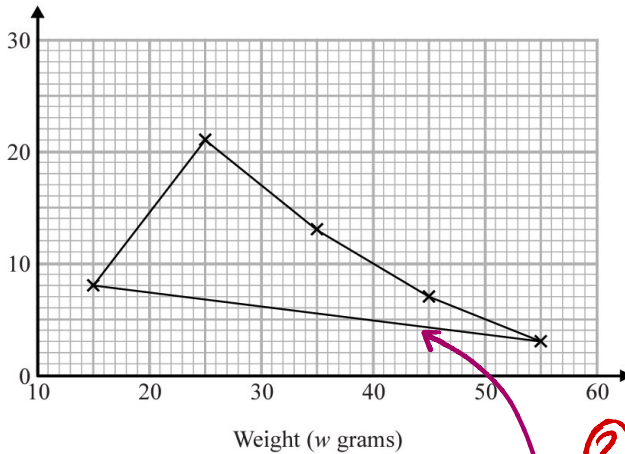
21

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.



only need 2 to write 2 errors

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

- Haven't labeled the y axis
- Polygon should not be closed i.e this bottom line shouldn't be here
- Point (15, 6) plotted incorrectly

(Total for Question 21 is 2 marks)

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

Complete the error interval for the length of the pencil.

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

(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

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.

	Tom : Adam	
Original	3 : 7	Total 240 stamps
New	3 : 5	Total 240 stamps

Seeing how many stamps Tom had originally and after the sale

Original $\rightarrow 3+7=10$ $\frac{240}{10} = 24$ $3 \times 24 = 72$ stamps

New $\rightarrow 3+5=8$ $\frac{240}{8} = 30$ $3 \times 30 = 90$ stamps

$90 - 72 = 18$

getting how many stamps '1' in the ratio is worth

Finding how many stamps were sold

18

(Total for Question 23 is 4 marks)

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DO NOT WRITE IN THIS AREA



- 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.

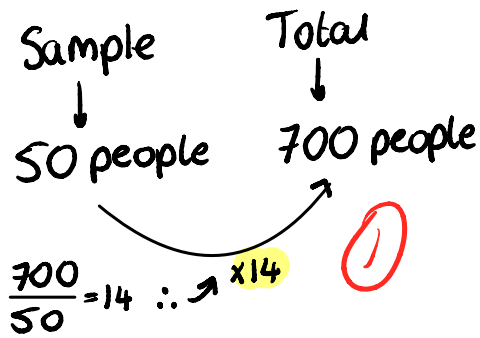
The table shows information about his results.

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

$$17 \times 14 = 238$$

There are 700 people in the fitness club.

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



$$238$$

(2)

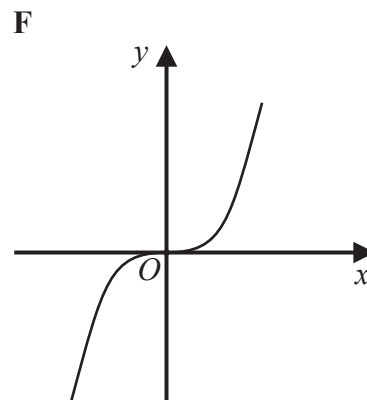
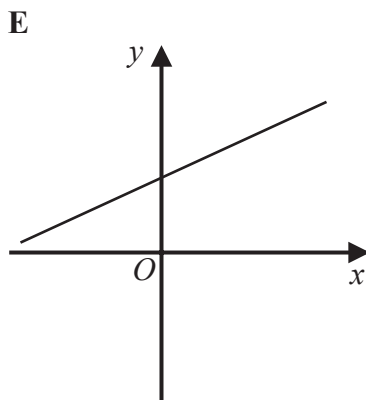
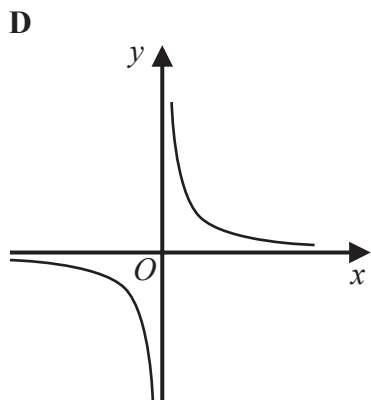
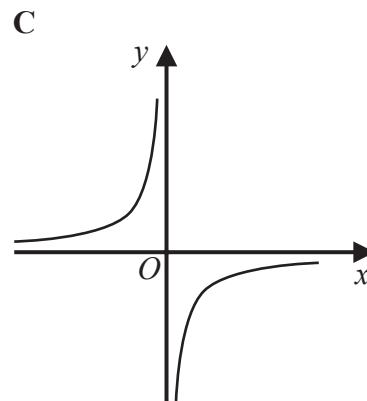
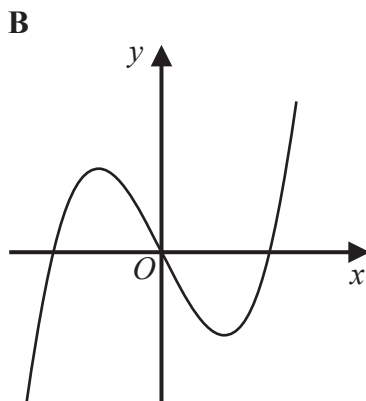
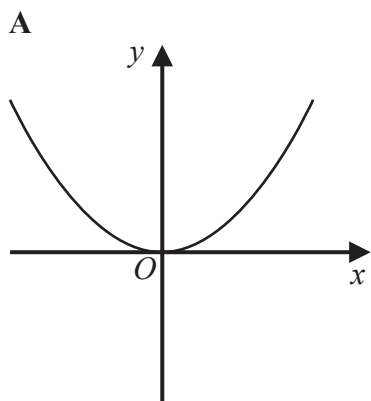
- (ii) Write down any assumption you made and explain how this could affect your answer.

We've assumed the sample is representative (1)

(1)

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)

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DO NOT WRITE IN THIS AREA



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.

	$n=1$	$n=2$	$n=3$	$n=4$	$n=5$	$n=6$	$n=7$
$2n^2 - 1$	1	7	17	31	49	71	97
$40 - n^2$	39	36	31	24	15	4	-9

③
 clear that
 as these sequences
 continue they
 won't cross again

27

Work out $(3.42 \times 10^{-7}) \div (7.5 \times 10^{-6})$

Give your answer in **standard form**.

$$\frac{a^x}{a^y} = a^{x-y}$$

$$\frac{3.42 \times 10^{-7}}{7.5 \times 10^{-6}} = 0.456 \times \frac{10^{-7}}{10^{-6}} = 0.456 \times 10^{-7-(-6)} = 0.456 \times 10^{-7+6}$$

$$\textcircled{1} = 0.456 \times 10^{-1} = 4.56 \times 10^{-2}$$

$$\textcircled{1} \\ \underline{4.56 \times 10^{-2}}$$

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: $n \times 40 = \frac{720}{n}$

$$\frac{40n}{40} = \frac{720}{40}$$

$$n = 18$$

Hayley's Company: $n \times 30 = \frac{720}{n}$

$$\frac{30n}{30} = \frac{720}{30}$$

$$n = 24$$

$$24 - 18 = 6$$

①

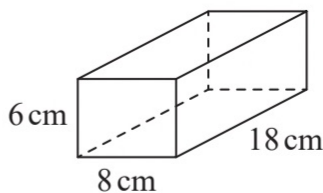
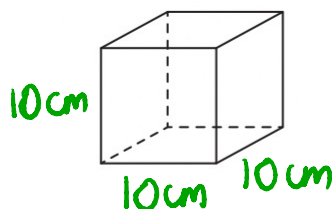
①

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.

SA cuboid:

$$6 \times 8 = 48 \text{ cm}^2$$

$$6 \times 18 = 108 \text{ cm}^2$$

$$8 \times 18 = 144 \text{ cm}^2$$

$$48 + 108 + 144 = 300 \text{ cm}^2 \text{ (1)}$$

$$300 \times 2 = 600 \text{ cm}^2 \text{ (1)}$$

Area of each face in cube must be the same

$$\therefore \text{area of one face} = \frac{600}{6} = 100 \text{ cm}^2$$

Length of each side in cube must be the same

Since area = 100 cm^2 each length must be 10 cm (1)
(because $10 \times 10 = 100$)

Volume of cube: $10 \times 10 \times 10 = 1000 \text{ cm}^3$ ← Volume = $h \times w \times d$

Volume of cuboid: $6 \times 8 \times 18 = 864 \text{ cm}^3$ (1)

No Janet is not correct since $1000 \neq 864$ (1)

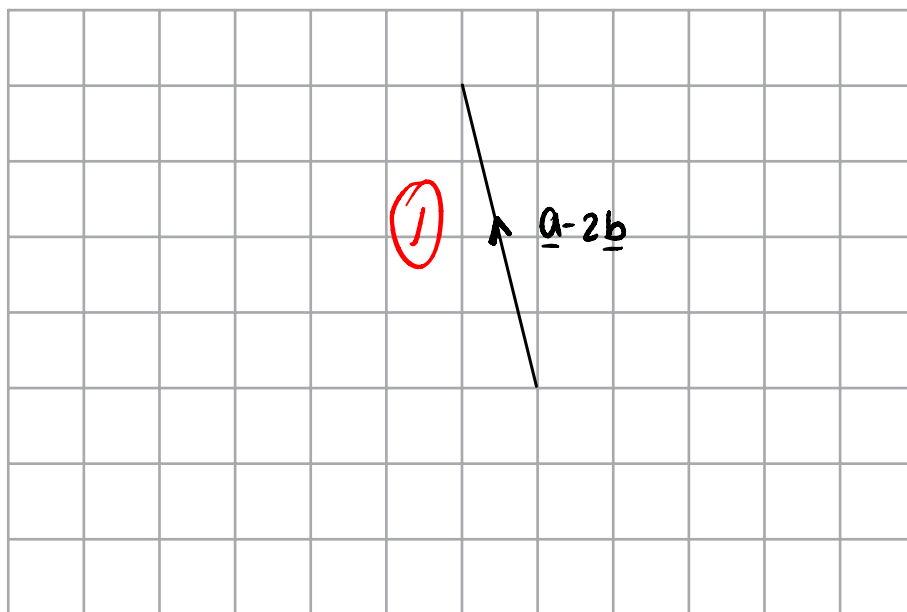
30 Here are two column vectors.

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

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

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

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



(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

