

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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Tuesday 11 June 2019

Morning (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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6/7/1/1/1/1/

.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

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 478 to the nearest hundred.

There is a 4 in the hundreds place. The number in the next place determines if the 4 rounds up to a 5 or rounds down to stay as a 4. 0-4 rounds down and 5-9 rounds up. Everything after the hundreds place is ignored and is set to 0

(Total for Question 1 is 1 mark)

2 Write down a multiple of 8 that is between 41 and 60

Multiples of 8 include 8, 16, 24, 32...

(Total for Question 2 is 1 mark)

3 Change 1.5 kilometres to metres.

There are 1000 metres in a kilometre

..... metres

(Total for Question 3 is 1 mark)

4 Here is a list of numbers.

4 6 9 10 15 27 30 40

From the list, write down all the numbers that are powers of 3

$3^1 = 3$
 $3^4 = 3 \times 3 \times 3 \times 3 = 81$
So 3 and 81 are examples of powers of 3

(Total for Question 4 is 1 mark)

5 Write 19% as a fraction.

Percent means out of 100

(Total for Question 5 is 1 mark)

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6 Work out 20% of 80

$20\% \times 80$

(Total for Question 6 is 2 marks)

7 There are four types of counter in a bag.

The table shows the number of each type of counter in the bag.

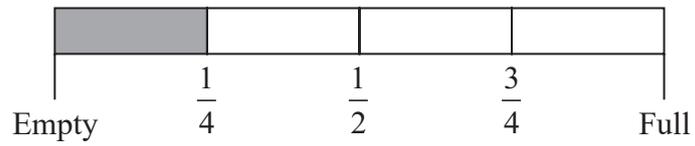
Type of counter	red circle	green circle	red square	green square
Number of counters	16	26	11	7

There are more green counters than red counters.
How many more?

Subtracting the number of red counters from the number of green counters works out the difference and therefore how many more

(Total for Question 7 is 2 marks)

8 Here is the gauge for the fuel tank of a car.



The fuel tank holds 52 litres of fuel when the tank is full.

The tank is $\frac{1}{4}$ full of fuel.

Work out how many more litres of fuel are needed to fill the tank.

1 tank of fuel subtract $\frac{1}{4}$ tank of fuel leaves the fraction of the tank which needs to be filled. Work out this fraction of the 52 litres

..... litres

(Total for Question 8 is 3 marks)

9 Simplify $4e + 6f + 7e - f$

Collect the like terms.
 $4e + 7e + 6f - f$

(Total for Question 9 is 2 marks)

10 Bill has 400 counters in a bag.

He gives

35 of the counters to Sameena

50 of the counters to Henry

75 of the counters to Lucas

What fraction of the 400 counters is left in Bill's bag?

Give your fraction in its simplest form.

Subtracting the counters given to each person leaves the counters left in Bill's bag. It is a fraction of 400 so this is put over 400

(Total for Question 10 is 3 marks)

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11 The table shows the costs of sending a parcel by the Express service and by the Rapid service.

Type of service	Cost
Express	£15.25
Rapid	£35.38

Brendan has to send 12 parcels.
It will be cheaper to send the parcels by the Express service than by the Rapid service.

(a) How much cheaper?

Subtracting the cost of the Express from the Rapid works out how much cheaper it is per parcel. Multiplying this by 12 works out how much cheaper it is for all 12 parcels

£
(3)

Luke wants to send 21 parcels by the Express service.
He does the calculation $20 \times £15 = £300$ to estimate the cost.

(b) Explain why Luke's calculation shows the actual cost will be more than £300

Both the number of parcels and the price have been rounded down. What effect will that have on the total cost?

(1)

(Total for Question 11 is 4 marks)

12 Ali, Ben and Cathy share an amount of money in the ratio 6 : 9 : 10

What fraction of the money does Ben get?

Adding 6, 9 and 10 works out how many parts there are altogether. 9 parts out of the total number of parts are for Ben

(Total for Question 12 is 2 marks)

13 The first term of a sequence of numbers is 24
The term-to-term rule of this sequence is 'add 8'

Josie says,

"No number in this sequence is in the 5 times table."

(a) Give an example to show that Josie is wrong.

Press 24 then = to set 24 as the answer. Press Ans + 8 and keep pressing = until a multiple of 5 is found

(1)

(b) Is 85 a number in this sequence?
Give a reason for your answer.

Use the same method as in part (a) and keep pressing = to see if 85 is in the sequence

(1)

(Total for Question 13 is 2 marks)

14 Find the value of $\frac{5.27 + 3.5}{7.9 - 4.36}$

Give your answer as a decimal.
Write down all the figures on your calculator display.


 Type into the calculator exactly as it is above. Press the button on the left first. Press the button on the right twice to convert into a decimal to 8 decimal places
 

(Total for Question 14 is 2 marks)

15 You can use this rule to work out the total hire charge, in pounds (£), for hiring a 3D printer for a number of weeks.

$$\text{Total hire charge (£)} = \text{number of weeks} \times 70 + 50$$

Mia wants to hire a 3D printer for 4 weeks.

(a) Work out the total hire charge.

The number of weeks is 4 so substitute this into the formula for the total hire charge

£.....
(2)

Zahir hires a 3D printer.
The total hire charge is £680

(b) For how many weeks does Zahir hire the 3D printer?

$680 = n \times 70 + 50$

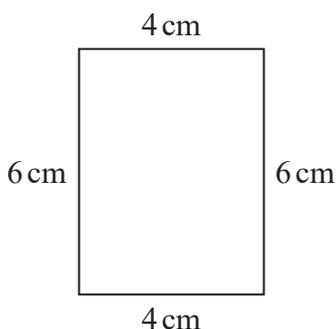
Substitute in 680 for the total hire charge and n for the number of weeks

Rearrange to find n, the number of weeks

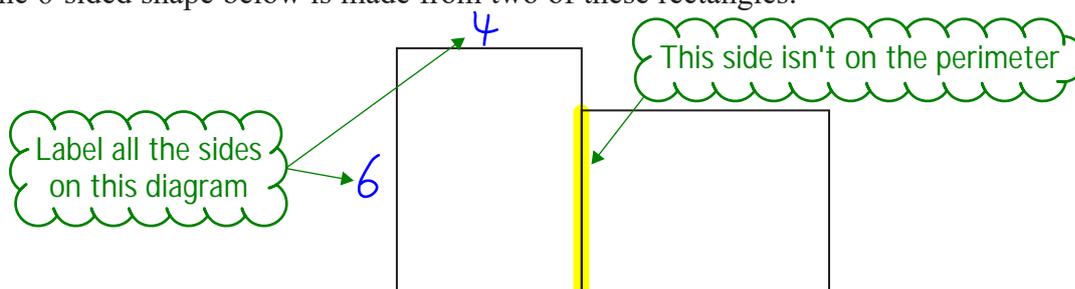
..... weeks
(2)

(Total for Question 15 is 4 marks)

16 Here is a rectangle.



The 6-sided shape below is made from two of these rectangles.



Work out the perimeter of this 6-sided shape.

Perimeter is the total of all of the outside sides added together

..... cm

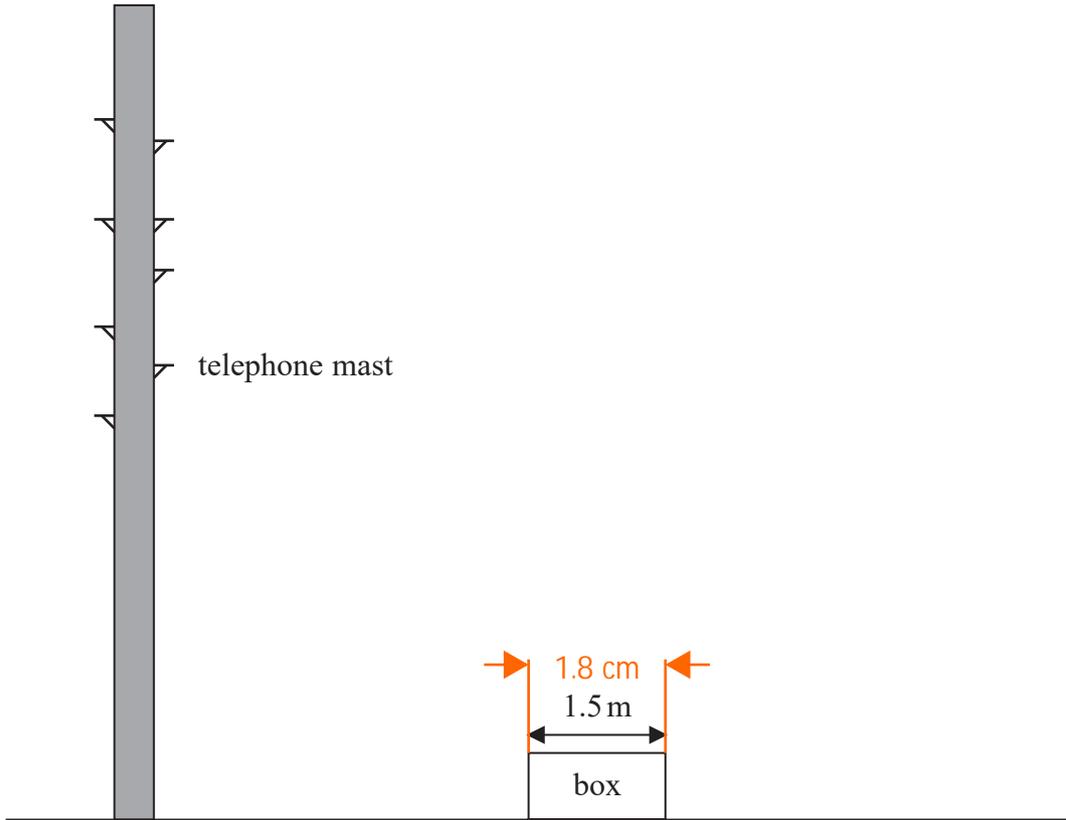
(Total for Question 16 is 3 marks)

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17 The accurate scale diagram shows a telephone mast and a box.



The box has a real width of 1.5 metres.

Find an estimate for the real height, in metres, of the telephone mast.

Measure the height of the telephone mast in centimetres using a ruler then work out how many times larger that is than the 1.8cm width of the box. Multiply that number by the 1.5m to get the height of the telephone mast

..... metres

(Total for Question 17 is 2 marks)

18 The table shows information about the numbers of points scored by 30 students in a quiz.

Number of points	Frequency
0	4
1	3
2	7
3	5
4	6
5	5

(a) Find the modal number of points.

The modal number of points is the one with the highest frequency

.....
(1)

(b) Work out the total number of points scored.

Multiplying the number of points by the frequency for each row gives the total number of points for each category. Then adding up the total for each row gives the overall total number of points scored

.....
(2)

(Total for Question 18 is 3 marks)

19 Make x the subject of the formula $y = 2x + 4$

Follow BIDMAS backward to decide which order to get rid of the 2 and 4 from the right side of the equation. To get rid of addition, subtract. To get rid of multiplication, do the opposite

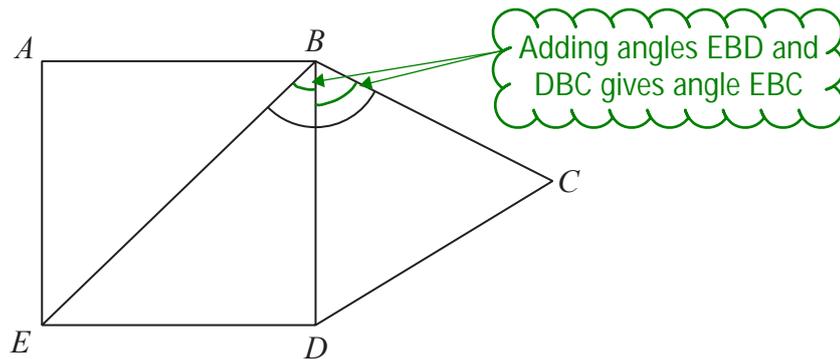
.....
(Total for Question 19 is 2 marks)

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20 The diagram shows a square $ABDE$ and an equilateral triangle BCD .



Work out the size of angle EBC .

There are 180 degrees in a triangle and it is an equilateral so all the angles are the same. The angle in a square is a right angle so is 90 degrees. The diagonal BE cuts the angle in half so it is divided by 2

(Total for Question 20 is 2 marks)

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21 Liz goes on holiday to South Africa.

Liz wants to change £850 into South African rand.
She wants to get as many 200 rand notes as possible.

The exchange rate is £1 = 18.53 rand.

Work out the greatest number of 200 rand notes that Liz can get for £850

Each £1 gets 18.53 rand so £850 is 850 lots of 18.53 rand. Dividing this by 200 works out how many lots of 200 rand go into the total amount of rand

The result needs to be rounded as the number of notes needs to be a whole number. But we need to decide whether to round up or down

(Total for Question 21 is 3 marks)

22 In October Sally drove 560 miles in her car.

The car travelled 34.5 miles for each gallon of petrol used.

Petrol cost £1.08 per litre.

1 gallon = 4.55 litres.

Work out the cost of the petrol the car used in October.

Every lot of 34.5 miles used 1 gallon. So working out how many lots of 34.5 miles were driven therefore works out how many gallons were used.

Multiplying by 4.55 converts the number of gallons into litres as every gallon is 4.55 litres.

Multiplying by 1.08 works out the cost of the petrol as every litre costs £1.08

£.....

(Total for Question 22 is 4 marks)

23 Costcorp sells packets of mints to shop owners.

On Monday three shop owners buy mints from Costcorp.

Each shop owner buys small packets, medium packets and large packets of mints.

Alan buys 400 packets of mints.

32% are small packets.

40% are large packets.

Beryl buys 500 packets of mints.

$\frac{3}{10}$ are small packets.

$\frac{1}{10}$ are large packets.

Charlie buys 150 small packets of mints so that

number of small packets : number of medium packets = 3 : 4

Work out the total number of medium packets of mints these shop owners buy.

You must show all your working.

Adding together the number of medium packets bought by Alan, Beryl and Charlie works out the total number of medium packets they buy.

Alan: subtracting the percentage of the small and large packets from 100% leaves the percentage which were medium. To convert a percentage into a decimal multiplier, divide by 100. Multiplying 400 by the decimal multiplier works out the number of medium packets Alan bought.

Beryl: subtracting the fraction of the small and large packets from 1 leaves the fraction which were medium. Multiplying the 500 packets Beryl bought by the fraction which were medium works the number of medium packets she bought.

Charlie: 3 parts of the ratio represents the 150 small packets. Work out what 1 part of the ratio is worth then work out the 4 parts which represents the number of medium packets he bought.

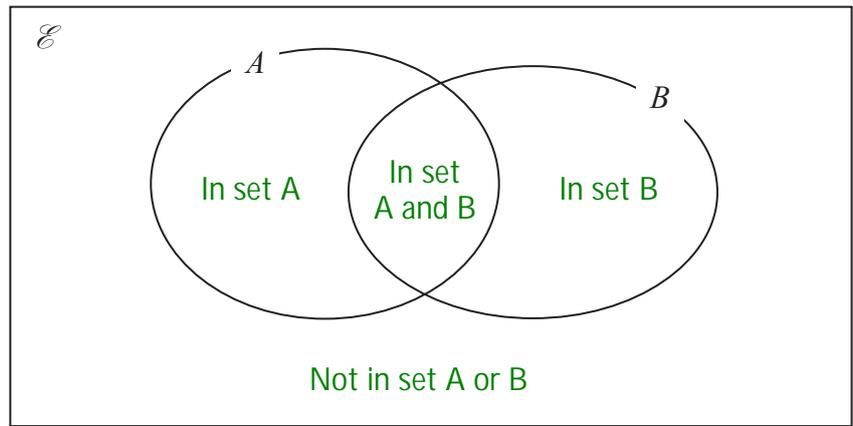
(Total for Question 23 is 5 marks)

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- 24 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$
 $A = \{1, 5, 6, 8, 9\}$
 $B = \{2, 6, 9\}$



- (a) Complete the Venn diagram to represent this information. (3)

A number is chosen at random from the universal set \mathcal{E} .

- (b) Find the probability that the number is in the set $A \cap B$

Out of the 9 numbers, there are ? in both A and B.

.....
(2)

(Total for Question 24 is 5 marks)

- 25 Katy invests £200 000 in a savings account for 4 years.
The account pays compound interest at a rate of 1.5% per annum.

Calculate the total amount of interest Katy will get at the end of 4 years.

Multiplying by 1.015 increases
by 1.5%. Subtracting the original
value leaves the interest.

£.....

(Total for Question 25 is 3 marks)

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26 The table shows information about the heights of 80 plants.

Height (h cm)	Frequency
$10 < h \leq 20$	7
$20 < h \leq 30$	13
$30 < h \leq 40$	14
$40 < h \leq 50$	12
$50 < h \leq 60$	16
$60 < h \leq 70$	18

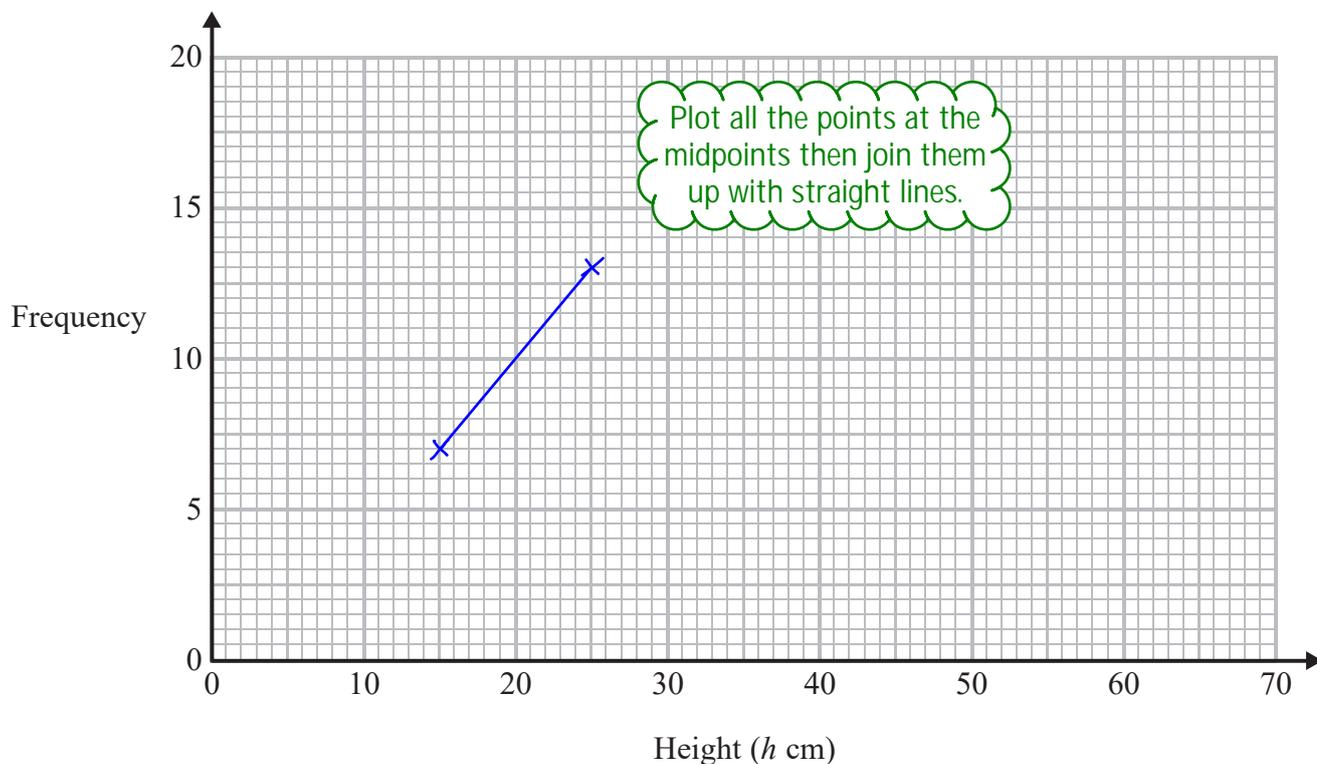
(a) Find the class interval that contains the median.

$$\frac{80+1}{2} = 40.5$$

So the value between the 40th and 41st value is the median.

(1)

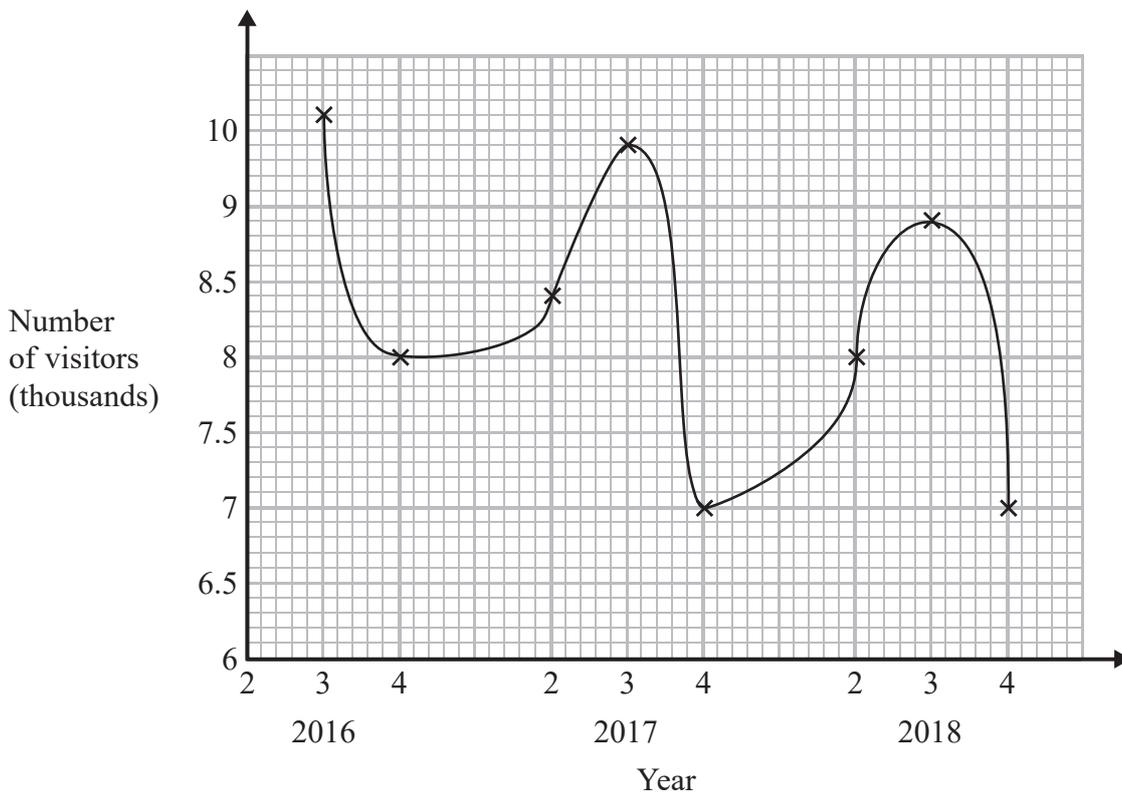
(b) On the grid, draw a frequency polygon for the information in the table.



(2)

(Total for Question 26 is 3 marks)

- 27 Sean has drawn a time series graph to show the numbers, in thousands, of visitors to a fun park.



Write down two things that are wrong or could be misleading with this graph.

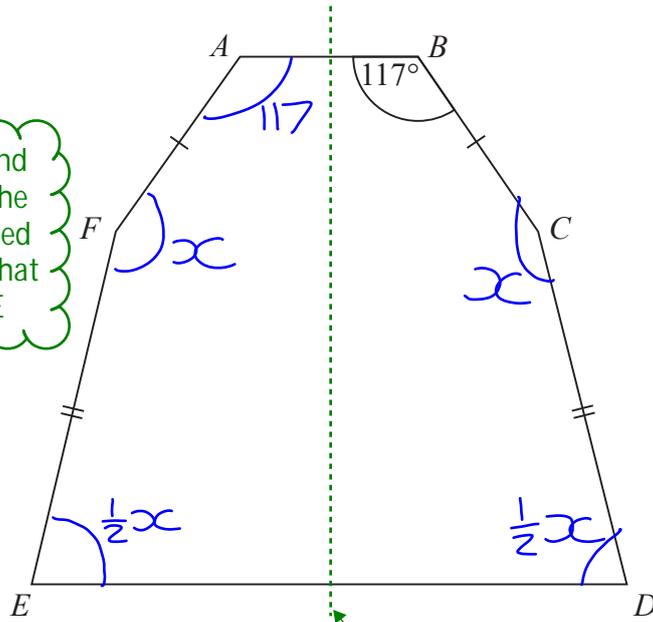
1

It must be something to do with the axes or the curve as we have no data for what the plotted points should be.

2

(Total for Question 27 is 2 marks)

28 The diagram shows a hexagon.
The hexagon has one line of symmetry.



The angle we are trying to find has been labelled as x then the other angles have been labelled based on the symmetry and that angle $BCD = 2 \times$ angle CDE

The shape must be symmetrical along this line.

$FA = BC$
 $EF = CD$
Angle $ABC = 117^\circ$

Angle $BCD = 2 \times$ angle CDE

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

Use $(n - 2) \times 180$, where n is the number of sides to calculate how many degrees there are altogether in a hexagon. Then create and solve an equation in terms of x .

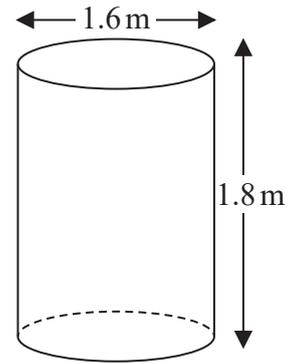
(Total for Question 28 is 4 marks)

29 Jeremy has to cover 3 tanks completely with paint.

Each tank is in the shape of a cylinder with a top and a bottom.
The tank has a diameter of 1.6 m and a height of 1.8 m.

Jeremy has 7 tins of paint.
Each tin of paint covers 5 m^2

Has Jeremy got enough paint to cover completely the 3 tanks?
You must show how you get your answer.



Calculate how much area 7 tins of paint will cover.

$\pi \times \text{diameter}$ gives the circumference. Multiplying this by the height gives the curved surface area.

2 lots of πr^2 as there are 2 circular surfaces per tank. The radius is half of the diameter.

There are 3 tanks so multiply the surface area of one of the tanks by 3.

Compare the amount of paint needed to the paint he has.

(Total for Question 29 is 5 marks)

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30 Solve the simultaneous equations

$$3x - 4y = 11$$

← Equation 1

$$9x + 2y = 5$$

← Equation 2

Equation 1 can be multiplied to get the same magnitude (number ignoring any negatives) of x. This creates Equation 3.

Adding or subtracting Equations 2 and 3 will cancel out the x terms leaving an equation in terms of y.

The equation can be solved to find y. Then substituting the value for y in either Equation 1 or 2 allows x to be found

$x =$

$y =$

(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS