Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Centre Number	Candidate Number

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/

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

.CG Maths.

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. There is a 7 in the next place and this causes the 4 to round up to a 5. Everything after the hundreds is ignored and is set to 0

500

(Total for Question 1 is 1 mark)

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

8 x 6 = 48 so 48 is a multiple of 8. 56 is also a multiple of 8 that is between 41 and 60

48

(Total for Question 2 is 1 mark)

3 Change 1.5 kilometres to metres.

There are 1000 metres in a kilometre so multiplying 1.5 by 1000 converts it into metres

1500 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

$3^1 = 3$
$3^2 = 3 \times 3 = 9$
$3^3 = 3 \times 3 \times 3 = 27$
$3^4 = 3 \times 3 \times 3 \times 3 = 81$

9, 27

(Total for Question 4 is 1 mark)

5 Write 19% as a fraction.

Percent means out of 100

$\frac{19}{100}$

(Total for Question 5 is 1 mark)

6 Work out 20% of 80

20% x 80

16

(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?

(26 + 7) - (16 + 11)

The total number of green counters

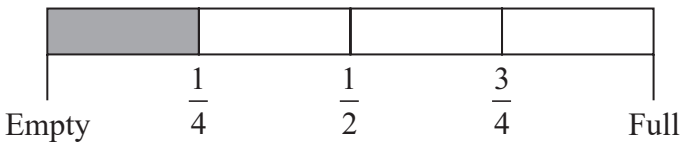
The total number of red counters

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

6

(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.

$\frac{3}{4} \times 52$

1/4 is full so 3/4 of the tank more is needed to fill the tank. This works out 3/4 of the 52 litres

39 litres

(Total for Question 8 is 3 marks)

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

Collect the like terms.
4e + 7e = 11e
6f - f = 5f

11e + 5f

(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.

$\frac{400-35-50-75}{400}$

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

$\frac{3}{5}$

(Total for Question 10 is 3 marks)

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?

12 (35.38 − 15.25)

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

£ 241.56

(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

The number of parcels and price was rounded down

(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?

$\frac{9}{6+9+10}$

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

$\frac{9}{25}$

(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.
24, 32, 40

40

(1)

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

No as 80 and 88 are in the sequence

(1)

(Total for Question 13 is 2 marks)

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

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

2.47740113

(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.

Total hire charge (£) = number of weeks × 70 + 50

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

(a) Work out the total hire charge.

$4 \times 70 + 50$ ← The number of weeks is 4 so substitute this into the formula for the total hire charge

£ 330

(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

$630 = n \times 70$ ← Using BIDMAS backward tells us that we need to get rid of the addition first. Subtracting 50 from both sides does this

Divide both sides by 70 to get rid of the multiplication → 9 weeks

(2)

(Total for Question 15 is 4 marks)

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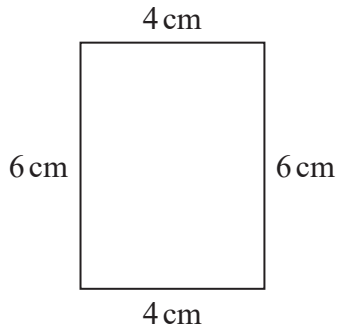
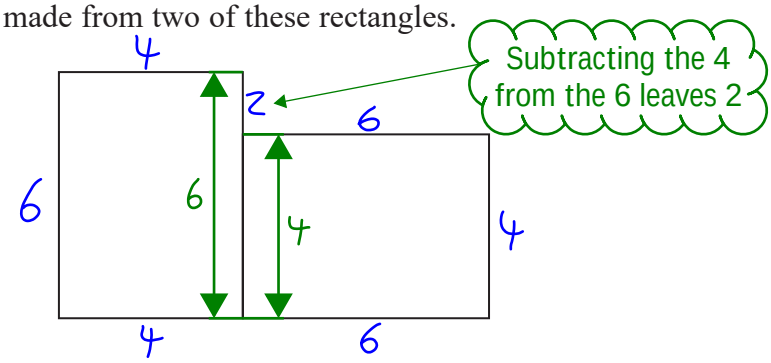
16 Here is a rectangle.



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



Work out the perimeter of this 6-sided shape.

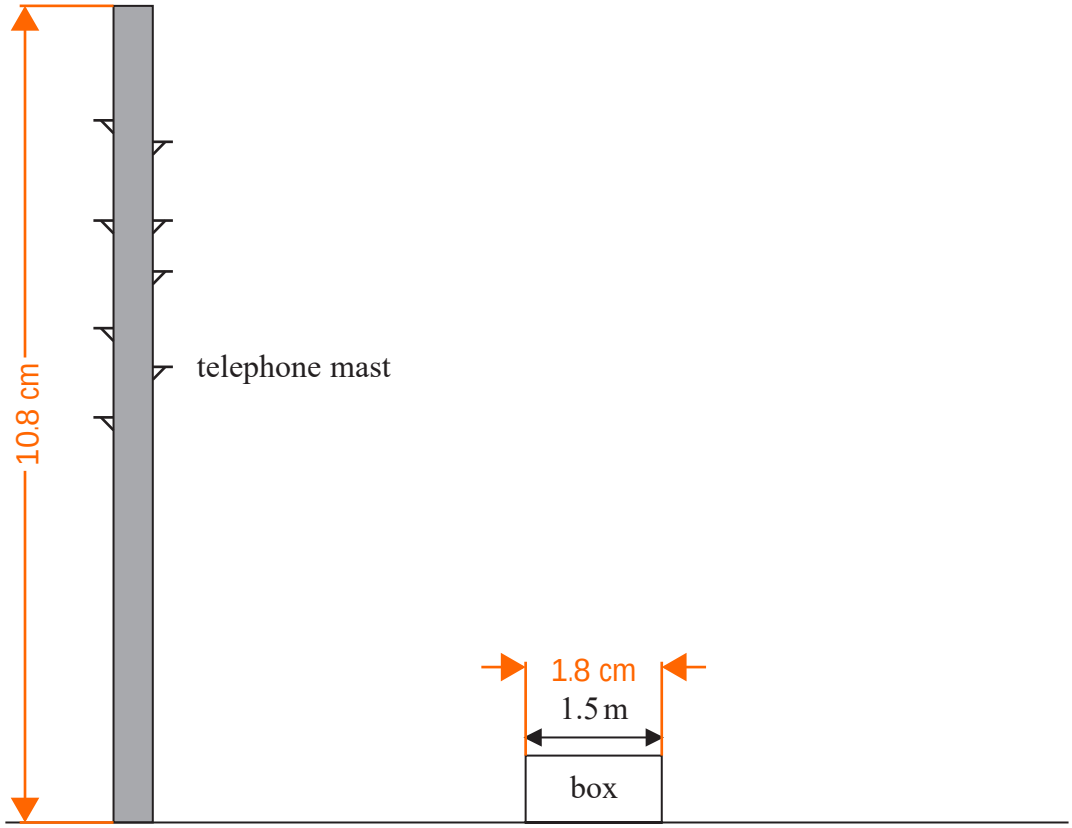
4 + 2 + 6 + 4 + 6 + 4 + 6

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

32 cm

(Total for Question 16 is 3 marks)

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.

$\frac{10.8}{1.8} \times 1.5$

10.8/1.8 works out how many times larger the 10.8 is than the 1.8. This many times the 1.5m gives the height of the telephone mast

9 metres

(Total for Question 17 is 2 marks)

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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

0
3
14
15
24
25

Multiplying the number of points by the frequency for each row gives the total number of points for each category

(a) Find the modal number of points.

The score of 2 had the highest frequency so is the mode

2

(1)

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

0 + 3 + 14 + 15 + 24 + 25

81

(2)

(Total for Question 18 is 3 marks)

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

$y - 4 = 2x$

Following BIDMAS backward tells us that we need to get rid of the addition first. To do this, subtract 4 from both sides

Next, to get rid of the 2 we need to divide both sides by 2

$x = \frac{y-4}{2}$

(Total for Question 19 is 2 marks)

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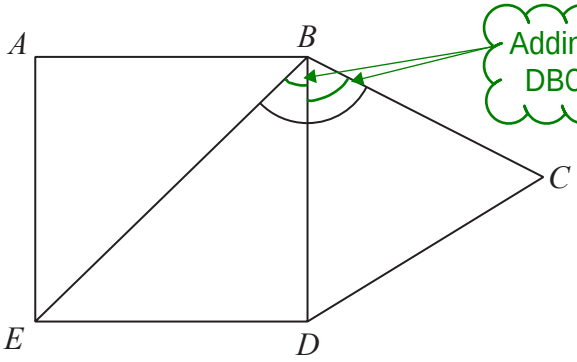
20 The diagram shows a square *ABDE* and an equilateral triangle *BCD*.



Adding angles EBD and DBC gives angle EBC

Work out the size of angle *EBC*.

$\frac{90}{2} + \frac{180}{3}$

There are 180 degrees in a triangle and it is an equilateral so all the angles are the same. Therefore dividing by 3 works out one of the angles

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

105 °

(Total for Question 20 is 2 marks)

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

$\frac{850 \times 18.53}{200}$

= 78.7525

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 78.7525 is rounded down as there has to be a whole number of notes and 79 notes would be worth more than the total amount of rand

78

(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.

$\frac{560}{34.5} \times 4.55 \times 1.08$

Every lot of 34.5 miles used 1 gallon. So dividing the distance of 560 by the 34.5 tells us how many lots of 34.5 miles were driven and therefore 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

£ 79.76

(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

$0.28 \times 400 + \frac{6}{10} \times 500 + \frac{150}{3} \times 4$

Alan: subtracting the percentage of the small and large packets from 100% leaves the percentage which were medium. 100 - 32 - 40 = 28. To convert a percentage into a decimal multiplier, divide by 100 so 28% as a decimal is 0.28. Multiplying 400 by 0.28 works out 28% of the 400 packets Alan bought

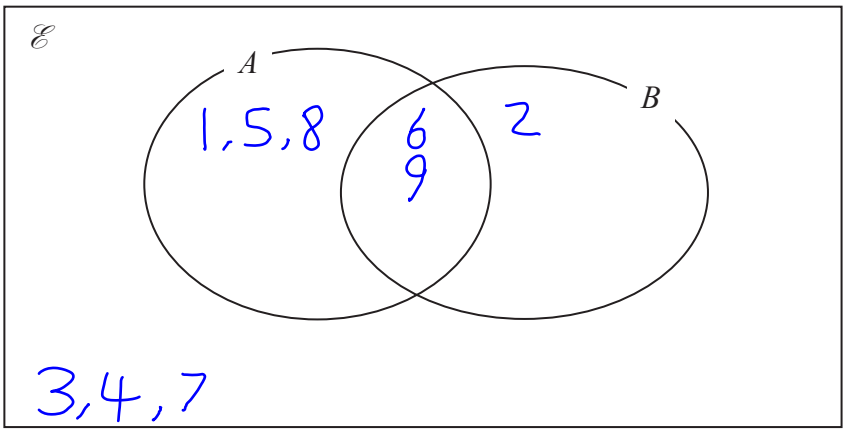
Charlie: 3 parts of the ratio represents the 150 small packets. So dividing by 3 works out 1 part of the ratio. Multiplying this by 4 works out the 4 parts which represents the number of medium packets

Beryl: subtracting the fraction of the small and large packets from 1 leaves the fraction which were medium. 1 - 3/10 - 1/10 = 6/10. Multiplying the 500 packets Beryl bought by 6/10 works out 6/10 of the amount of packets

612

(Total for Question 23 is 5 marks)

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



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

(3)

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

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

Out of the 9 numbers, there are 2 in both A and B.

$\frac{2}{9}$

(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.

$200000 \times 1.015^4 - 200000$

Multiplying by 1.015 increases by 1.5%. Raising to the power of 4 does this 4 times. Subtracting the original value leaves the interest.

£ 12272.71

(Total for Question 25 is 3 marks)

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

Doing a cumulative frequency until it reaches over 40.5 works out which interval the median is in.

Height (h cm)	Frequency	
$10 < h \leqslant 20$	7	7
$20 < h \leqslant 30$	13	20
$30 < h \leqslant 40$	14	34
$40 < h \leqslant 50$	12	46
$50 < h \leqslant 60$	16	
$60 < h \leqslant 70$	18	

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

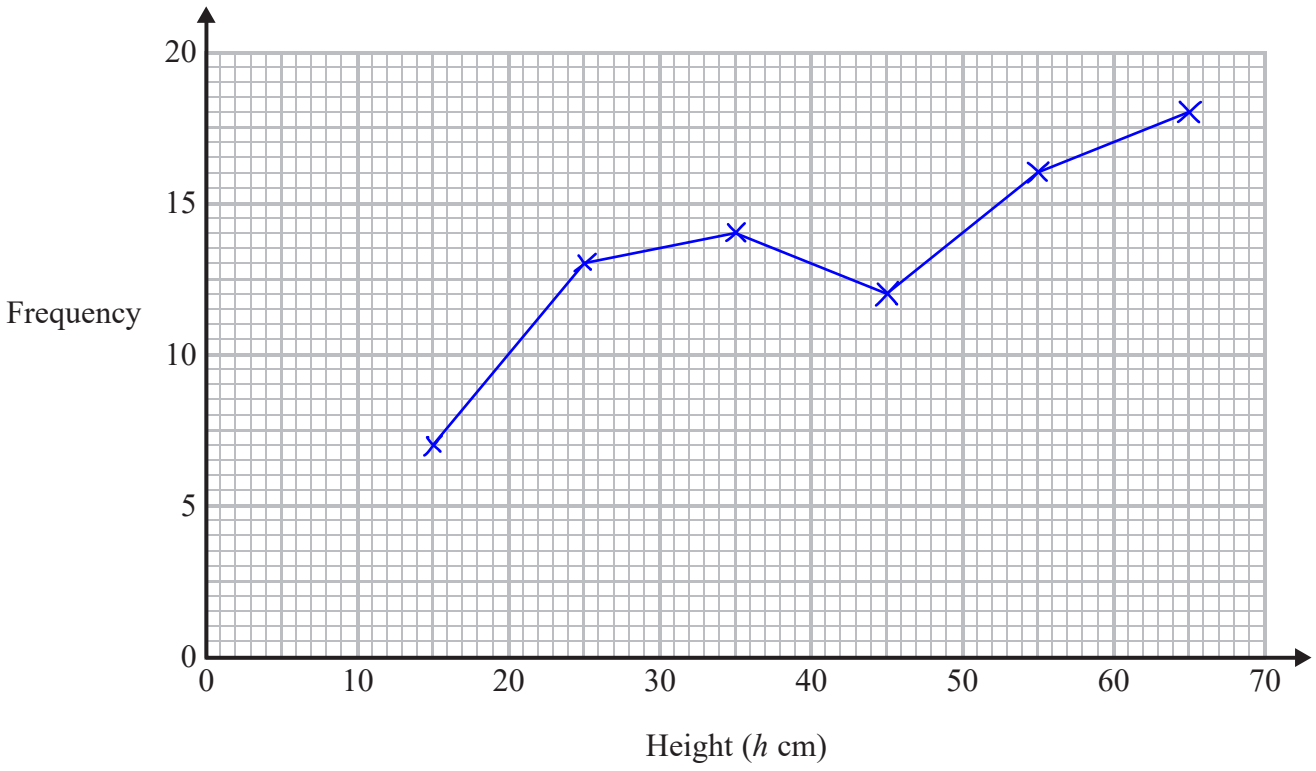
$\frac{80+1}{2} = 40.5$

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

$40 < h \leqslant 50$

(1)

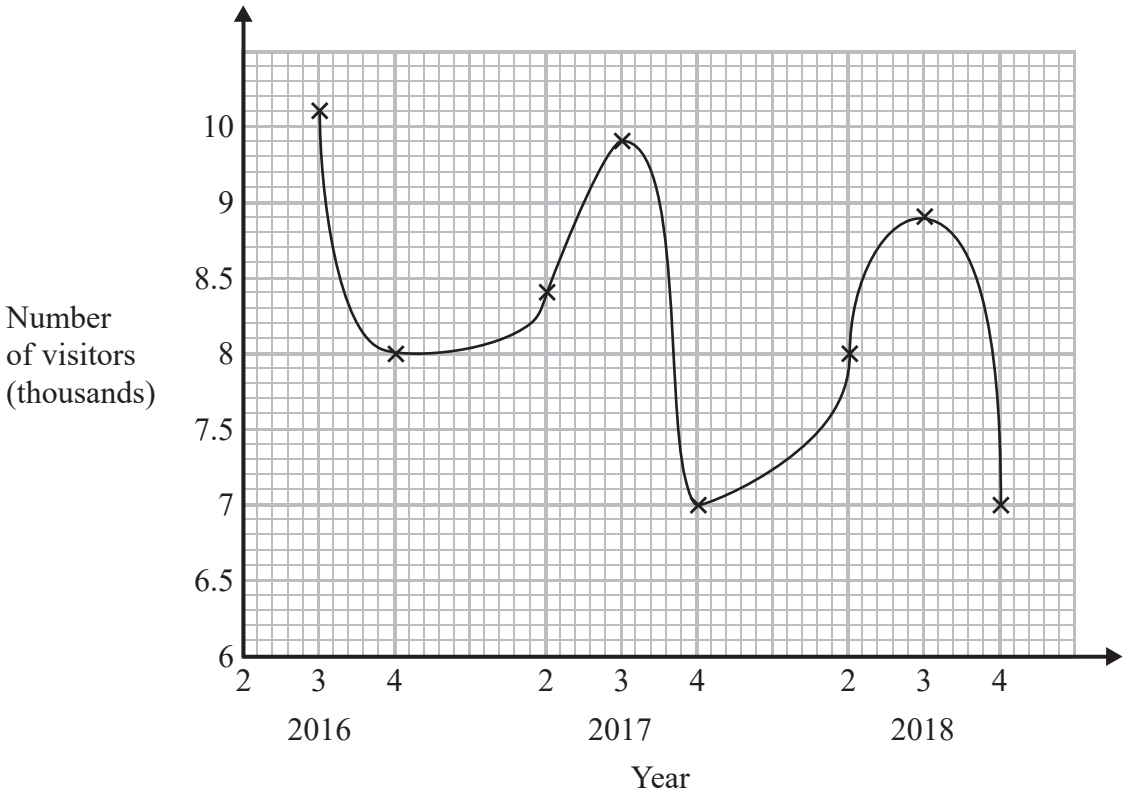
(b) On the grid, draw a frequency polygon for the information in the table.



(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.



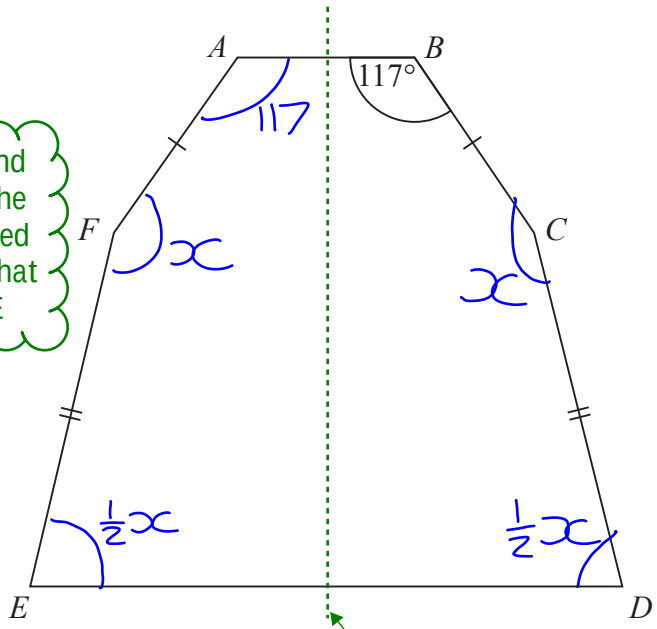
Write down two things that are wrong or could be misleading with this graph.

1 9.5 is missing on the y-axis.

2 It isn't clear what the numbers on the x-axis mean.

(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 x angle CDE

The shape must be symmetrical along this line.

$FA = BC$
$EF = CD$
Angle $ABC = 117°$

Angle $BCD = 2 \times$ angle CDE

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

$(6-2)180 = 720$

(n - 2) x 180, where n is the number of sides calculates how many degrees there are altogether in a hexagon.

$117 \times 2 + 3x = 720$

Adding up all the angles in the shape must give 720 degrees.

$x = \frac{720 - 117 \times 2}{3}$

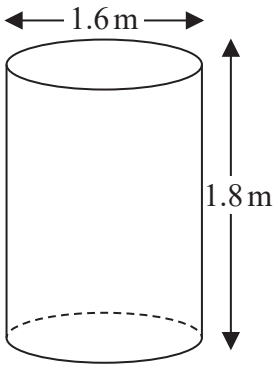
Rearranging the equation to get x on its own solves the equation.

162 °

(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.

$7 \times 5 = 35$

Calculating how much area 7 tins of paint will cover.

$3(\pi \times 1.6 \times 1.8 + 2(\pi \times (\frac{1.6}{2})^2)) = 39.2...$

π x diameter gives the circumference. Multiplying this be 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 multiplying the surface area of one of the tanks by 3.

$39.21 > 35$

No

The amount of paint needed is more than the paint he has.

(Total for Question 29 is 5 marks)

30 Solve the simultaneous equations

$3x - 4y = 11$ ← Equation 1

$9x + 2y = 5$ ← Equation 2

$9x - 12y = 33$ ← Multiplying Equation 1 by 3 to make the magnitude of x the same as equation 2. This creates Equation 3

$14y = -28$ ← Subtracting Equation 3 from Equation 2 to cancel out the x terms

$y = -2$ ← Dividing both sides by 14 to find y

$9x + 2(-2) = 5$ ← Substituting -2 for y in Equation 2

$9x = 9$ ← 2(-2) = -4. Adding 4 to both sides to get the x term on its own

Dividing both sides by 9 gets x = 1

$x =$ 1

$y =$ -2

(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

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