

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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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  $\pi$  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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Pearson

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.

7 > 5 so round up

500

(Total for Question 1 is 1 mark)

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

in the 8 times tables

~~32, 40, 56, 64~~  
out of range

48 or 56

(Total for Question 2 is 1 mark)

3 Change 1.5 kilometres to metres.

km → m  
x1000

1.5 x 1000 =

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

$$3^1 = 3$$

$$3^2 = 9$$

$$3^3 = 27$$

$$3^4 = 81 \quad - \text{not in list}$$

9, 27

(Total for Question 4 is 1 mark)

5 Write 19% as a fraction.

Percentage → decimal  
÷100

$$19 \div 100 = 0.19$$

decimal → fraction  
place value

$$\frac{19}{100}$$

$\frac{19}{100}$

(Total for Question 5 is 1 mark)

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- 6 Work out 20% of 80

$$20\% = 0.2$$

$$0.2 \times 80 =$$

..... 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?

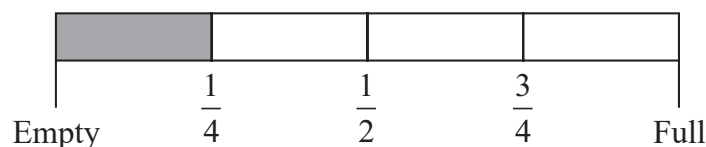
$$\text{Green: } 26 + 7 = 33$$

$$\text{Red: } 16 + 11 = 27$$

..... 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.

$$1 - \frac{1}{4} = \frac{3}{4} \quad - \quad \frac{3}{4} \text{ needed to fill tank}$$

$$\frac{3}{4} \times 52 = 39$$

..... 39

..... litres

(Total for Question 8 is 3 marks)



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

$$4 + 7 = 11$$

$$6 - 1 = 5$$

$$11e + 5f$$

(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.

$$400 - 35 - 50 - 75 = 240 \quad \text{— counters in the bag}$$

$$\frac{240}{400} \xrightarrow{\div 20} \frac{12}{20} \xrightarrow{\div 4} \frac{3}{5}$$

$$\frac{3}{5}$$

(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?

Cost Difference for 1 parcel:

$$35.38 - 15.25 = £20.13$$

Cost Difference for 12:

$$20.13 \times 12 = 241.56$$

$$£ \underline{241.56}$$

(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

Because Luke rounded 21 down to 20 and £15.38 to £15. Therefore his estimate is an underestimate.

(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?

$$\text{Total parts: } 6 + 9 + 10 = 25$$

Ben has 9 parts out of 25

$$\frac{9}{25}$$

(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.

$$24 + 8 = 32$$

$$32 + 8 = 40$$

40 is in the 5 times table and the sequence. (1)

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

No, all terms in the sequence are multiples of 8 and we started with a multiple and now adding 8. 85 is not a multiple 80 and 88 would be in the sequence instead. (1)

(Total for Question 13 is 2 marks)

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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.

$$= \frac{8.77}{3.54}$$

$$= 2.47740113$$

(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.

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

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

- (a) Work out the total hire charge.

$$\begin{aligned} 4 \times 70 + 50 \\ = 280 + 50 \end{aligned}$$

$$\text{£ } 330$$

(2)

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

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

$$\text{Weeks} = x$$

$$70x + 50 = 680$$

$$70x = 630$$

$$x = 9$$

equation can be formed

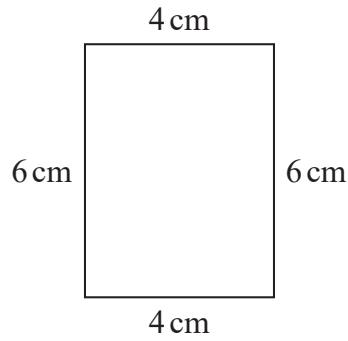
$$\dots\dots\dots 9 \dots\dots \text{weeks}$$

(2)

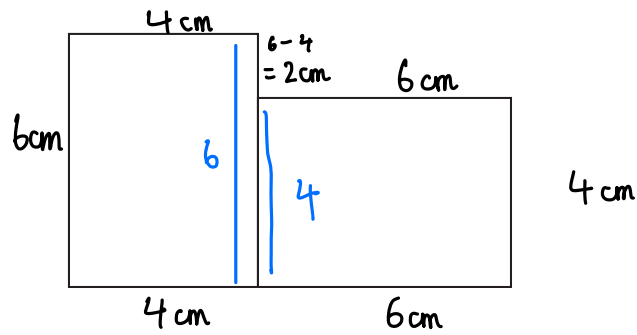
(Total for Question 15 is 4 marks)



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.

$$2 + 6 + 4 + 6 + 4 + 6 + 4 = 32 \text{ cm}$$

..... 32 ..... cm

(Total for Question 16 is 3 marks)

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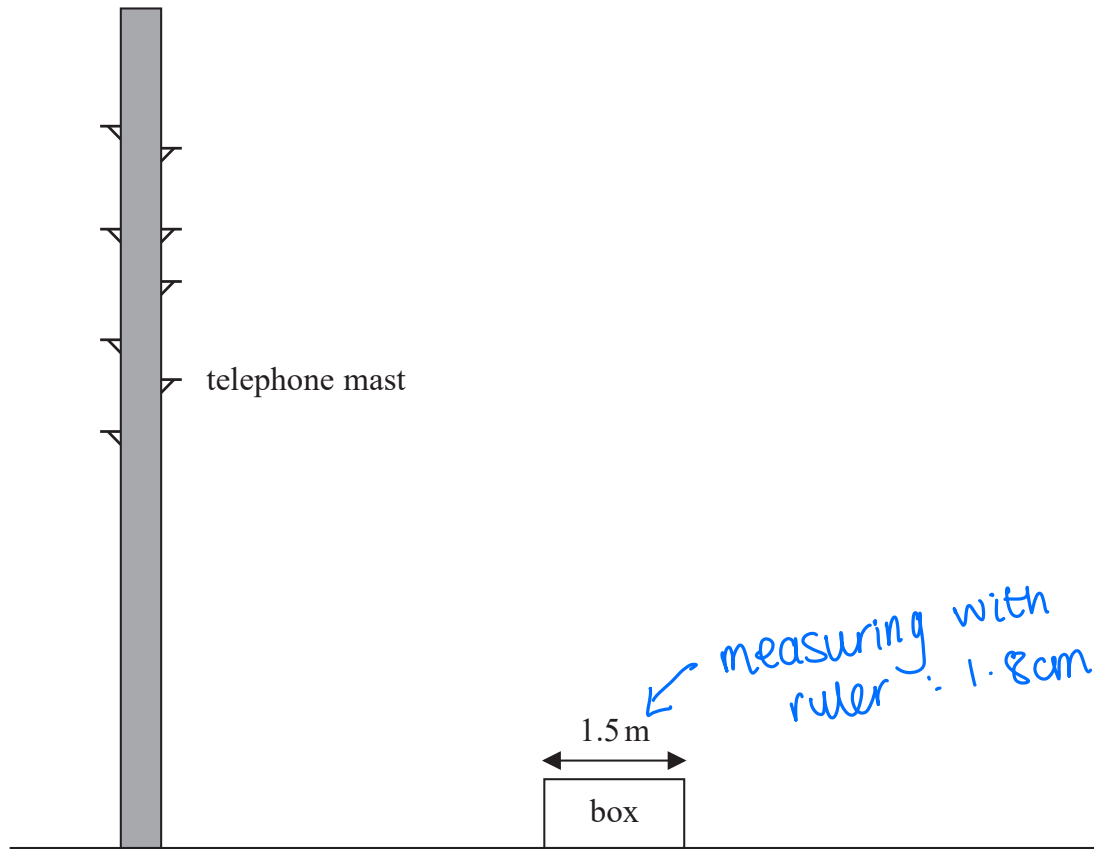
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17 The accurate scale diagram shows a telephone mast and a box.



The box has a real width of 1.5 metres.

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

$$\text{Scale : } 1.8 \div 1.5 = 1.2$$

The height of the telephone mast  
is 10.8 cm

$$10.8 \div 1.2 = 9$$

..... 9 ..... 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

- highest freq

(a) Find the modal number of points.

most occurring

2  
.....  
(1)

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

$$0 \times 4 = 0$$

$$1 \times 3 = 3$$

$$2 \times 7 = 14$$

$$3 \times 5 = 15$$

$$4 \times 6 = 24$$

$$5 \times 5 = 25$$

Total:

$$3 + 14 + 15 + 24 + 25 =$$

81  
.....  
(2)

(Total for Question 18 is 3 marks)

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

isolate  $x$

$$y = 2x + 4$$

$$y - 4 = 2x$$

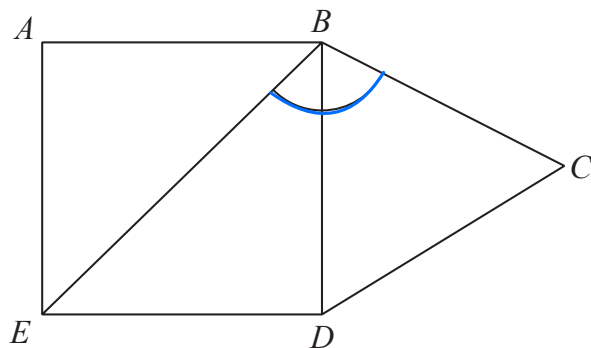
$$\frac{y - 4}{2} = x$$

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

(Total for Question 19 is 2 marks)



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



Work out the size of angle  $EBC$ .

$$\angle OBC = 60^\circ$$

angles in equilateral tri =  $60^\circ$

$$\angle ABD = 90^\circ$$

angles in squares are right angles

$$\angle ABE = 45$$

bisects = half the angle

$$\angle EBC = 60 + 45 =$$

.....  $105^\circ$

(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

$$\begin{aligned} & \text{£1} = 18.53 \text{ rand} \\ & \text{£850} = 15750.5 \text{ rand} \\ & 15750 \div 200 = 78.75 \dots \\ & \text{To calculate how many 200 rand notes} \quad \underline{78} \end{aligned}$$

(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.

Gallons needed for 560 miles:

$$560 \div 34.5 = 16.231 \dots \text{ gallons}$$

$$\begin{aligned} & 1 \text{ gallon} = 4.55 \text{ litres} \\ & 16.231 \dots = 73.855 \dots \text{ l} \\ & \text{litres of petrol needed} \end{aligned}$$

$$\text{Cost: } 73.855 \times 1.08 = 79.76$$

$$\text{£ } \underline{79.76}$$

(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.

Alan:  $100 - 32 - 40 = 28\%$  — % of medium  
 $28\%$  of 400 = 112 packets  
 $0.28 \times 400$

Beryl:  $1 - \frac{3}{10} - \frac{1}{10} = \frac{6}{10}$  — fraction of medium  
 $\frac{6}{10}$  of 500 = 300 packets  
 $(500 \div 10) \times 6$

Charlie:  $s : m$   
 $3 : 4$   
 $\times 50 \rightarrow 150 : 200 \leftarrow \times 50 = 200$  packets

$$112 + 300 + 200 =$$

612

(Total for Question 23 is 5 marks)

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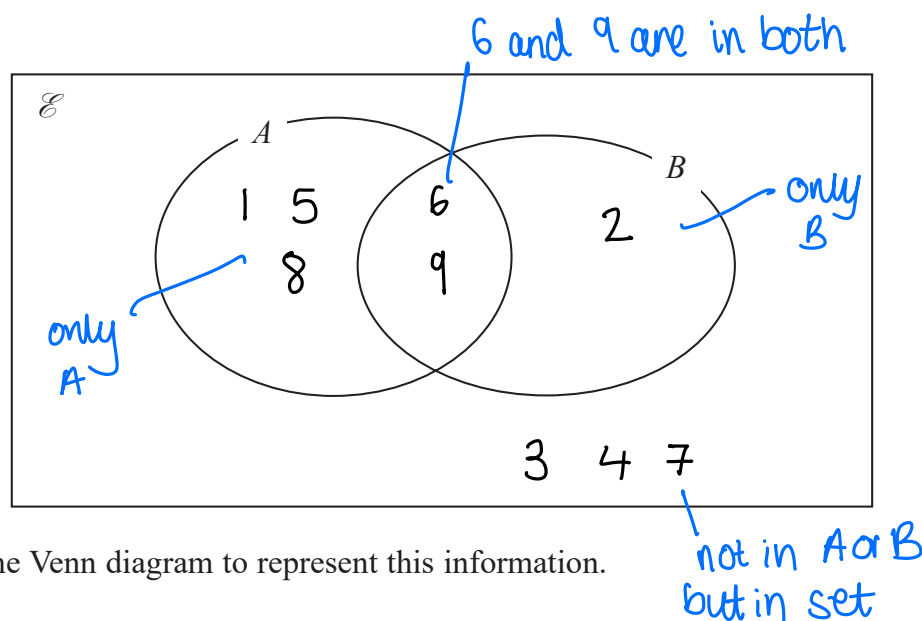
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24  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$A = \{1, 5, 6, 8, 9\}$

$B = \{2, 6, 9\}$



(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  $A \cap B$

in  $A$  and  $B$

6 and 9 (2 numbers) —  $\frac{2}{9}$

Total = 9 —  $\frac{2}{9}$

.....  
 $\frac{2}{9}$

(2)

(Total for Question 24 is 5 marks)

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- 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.

$$100 + 1.5 = 101.5\% \quad \begin{array}{l} \div 100 \\ = \end{array} \times 1.015$$

After 4 years:  $200,000 \times 1.015^4 = \pounds 212,272.71$

*starting money*      *multiplier*      *4 years*

$$212,272.71 - 200,000 =$$

*Total money in account*      *starting money*

*Interest earned*

£ 12,272.71

(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

7  
20  
34  
46 - has the 40.5 value  
62  
80

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

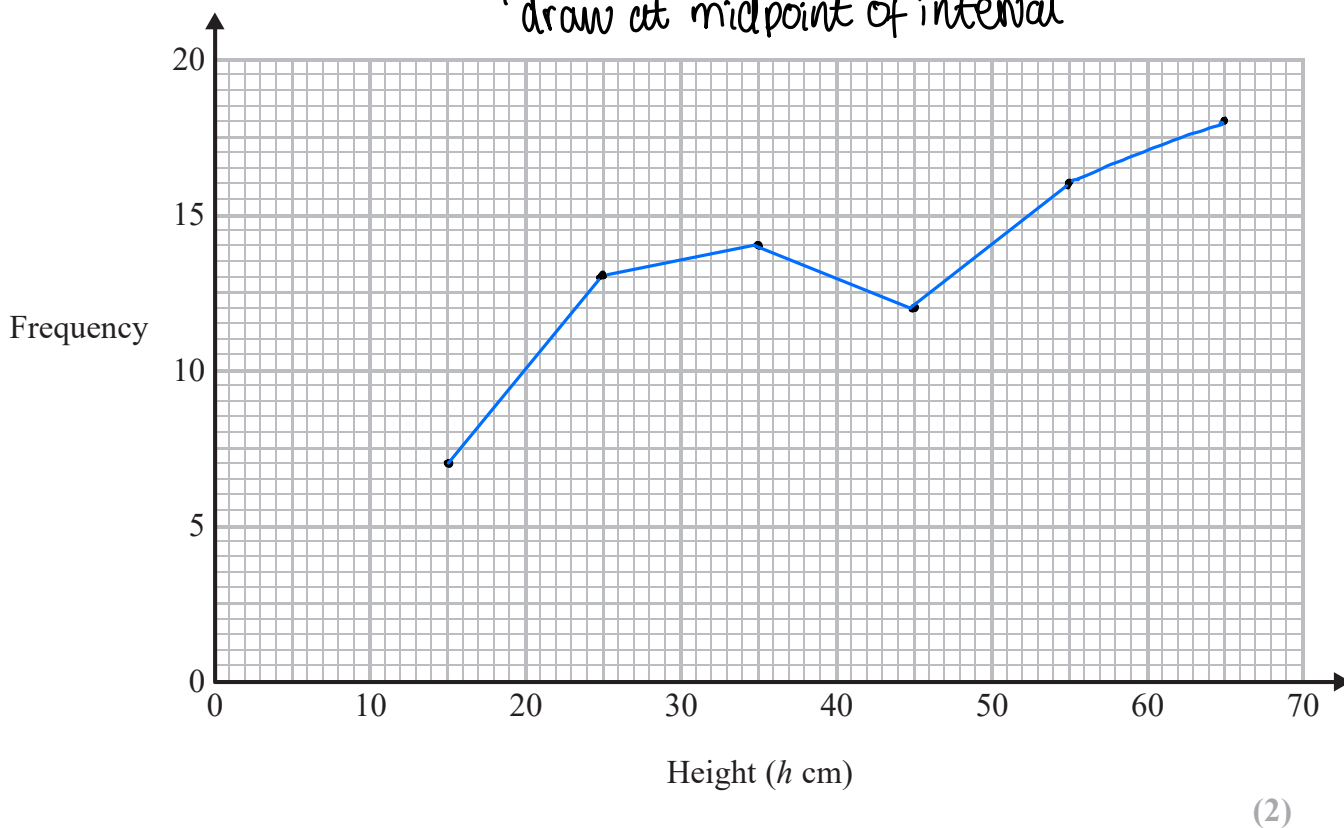
$$\frac{80+1}{2} = 40.5^{\text{th}} \text{ value}$$

$$40 < h \leq 50$$

(1)

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

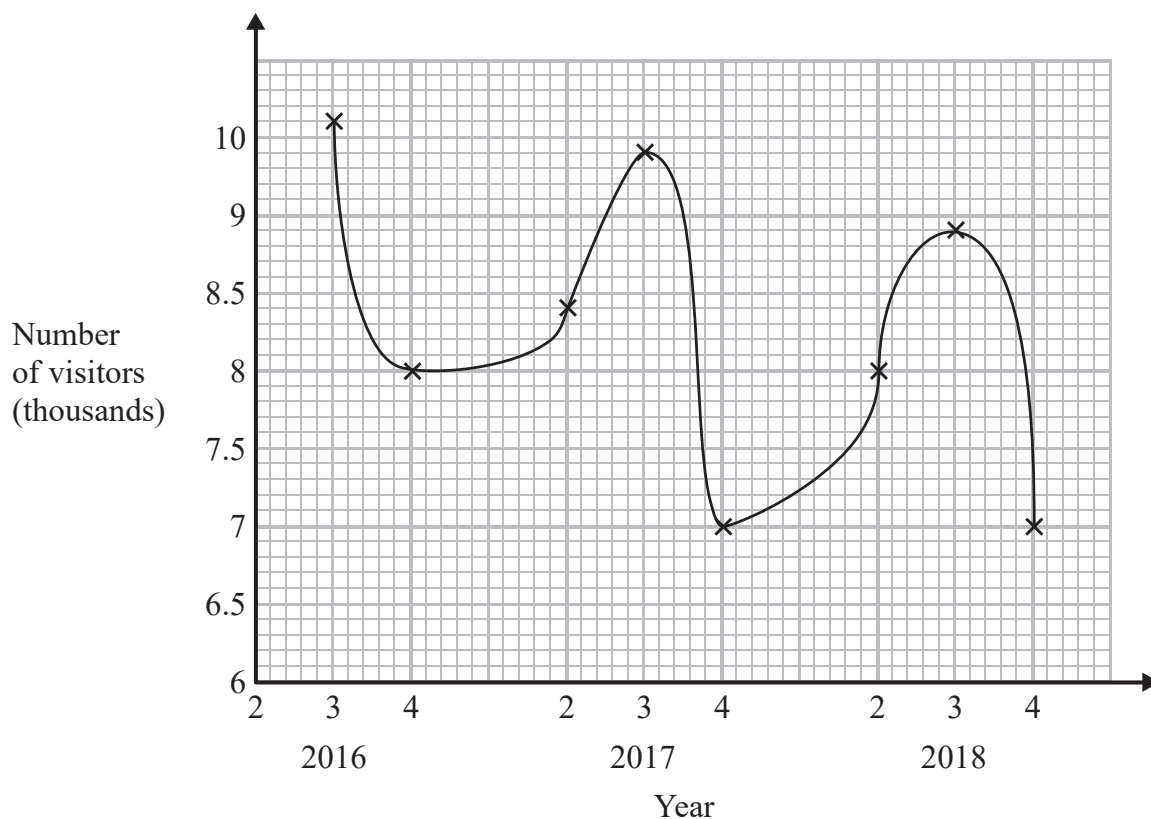
draw at midpoint of interval



(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 Should be joint with straight lines using a ruler
- 2 The 1<sup>st</sup> Quarter of each year is missing - this is misleading

(Total for Question 27 is 2 marks)

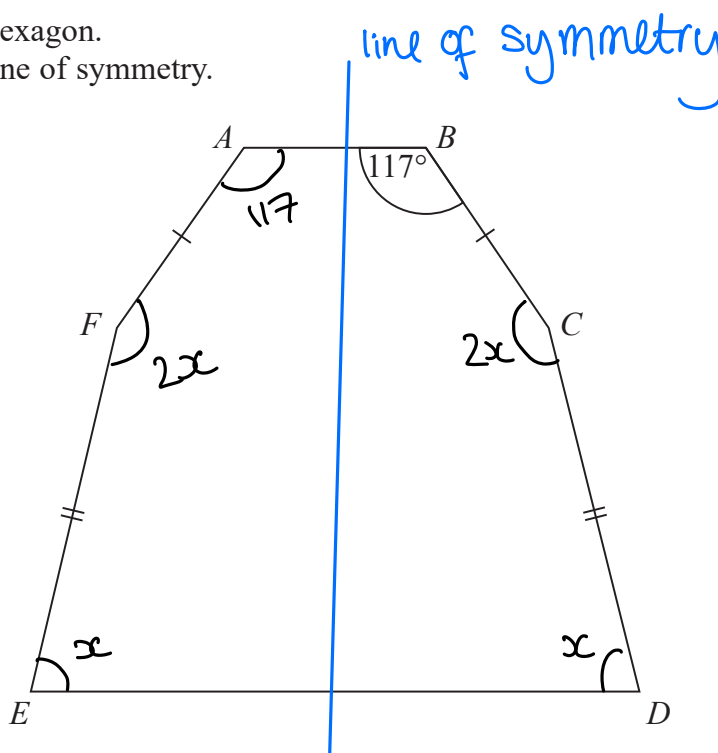
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- 28 The diagram shows a hexagon.  
The hexagon has one line of symmetry.



$$FA = BC$$

$$EF = CD$$

$$\text{Angle } ABC = 117^\circ$$

$$\text{Angle } BCD = 2 \times \text{angle } CDE$$

Work out the size of angle  $AFE$ .

You must show all your working.

$$\begin{aligned} \text{Angles in hexagon (6 sides)} & : 180(6-2) = \\ & 180 \times 4 = 720^\circ \end{aligned}$$

$$117 + 117 + 2x + 2x + x + x = 720$$

collect like terms

$$6x + 234 = 720$$

$$6x = 486$$

$$\div 3$$

$$2x = 162$$

$$\begin{aligned} \angle AFE &= 2x \\ &\text{not } x \end{aligned}$$

$$\dots\dots\dots 162^\circ$$

(Total for Question 28 is 4 marks)

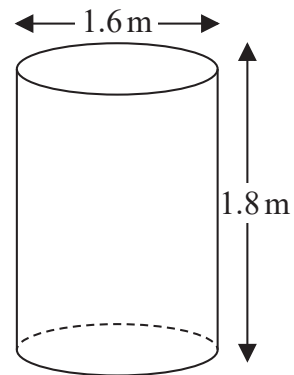


29 Jeremy has to cover 3 tanks completely with paint.

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  $5 \text{ m}^2$



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




(tank)

Surface area of 1 cylinder:  $2\pi r^2 + h\pi d$  - circumference

$d = 1.6$   
 $r = 0.8$

top   
bottom 



$$= 2\pi \times 0.8^2 + 1.8 \times 1.6\pi$$

$$= 4.16\pi \times 3$$

$$\text{SA of 3 tanks} = 12.48\pi \text{ m}^2$$

$$= 39.207\dots \text{ m}^2 \text{ to be covered}$$

$$\text{He has : } 7 \times 5 = 35 \text{ m}^2$$

$$35 < 39.2\dots$$

No, Jeremy can only cover  $35 \text{ m}^2$  but  
needs to cover more ( $39.2 \text{ m}^2$ )

(Total for Question 29 is 5 marks)

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30 Solve the simultaneous equations

$$3x - 4y = 11 \quad \textcircled{1}$$

$$9x + 2y = 5 \quad \textcircled{2}$$

$$\begin{array}{r} \textcircled{1} \quad 3x - 4y = 11 \quad + \\ \textcircled{2} \times 2 \quad 18x + 4y = 10 \\ \hline \end{array}$$

$$21x = 21$$

$$\div 21$$

$$x = 1$$

sub into  $\textcircled{1}$   $3 - 4y = 11$

$$-4y = 8$$

$$\div -4$$

$$y = -2$$

$$x = 1$$

$$y = -2$$

(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS



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