

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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

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, Formulae Sheet (enclosed). 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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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.CG Maths.
Worked Solutions


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 the following numbers in order of size.
Start with the smallest number.

-7 7 0 -2 -1

The more negative or less positive a number is, the smaller it is

-7, -2, -1, 0, 7

(Total for Question 1 is 1 mark)

- 2 Write 37% as a fraction.

Percentage is out of 100

$\frac{37}{100}$

(Total for Question 2 is 1 mark)

- 3 Write down the 7th odd number.

1, 3, 5, 7, 9, 11

Writing the odd numbers in order until the 7th is reached

13

(Total for Question 3 is 1 mark)

- 4 Change 53 centimetres to millimetres.

$53 \times 10 = 530$

There are 10mm in 1cm. So multiplying the number of centimetres by 10 converts it into millimetres

530

..... millimetres

(Total for Question 4 is 1 mark)

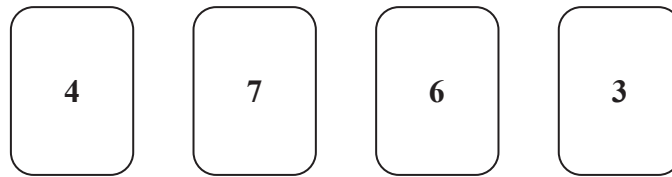
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- 5 Here are four cards.
There is a number on each card.



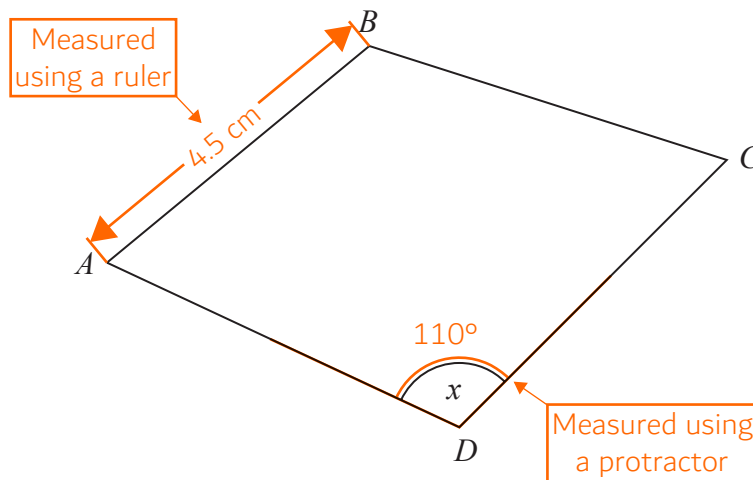
Write down the smallest 4-digit even number that can be made using each card only once.

The digits are worth more earlier in the number so the smallest digits should be used first. An even digit needs to be used last to make the number even

3476

(Total for Question 5 is 1 mark)

- 6 Here is a quadrilateral $ABCD$.



- (a) Measure the length of the side AB .
Give your answer in centimetres.

..... 4.5 centimetres
(1)

- (b) Measure the size of the angle marked x .

..... 110
(1)

(Total for Question 6 is 2 marks)

- 7 Myles writes down the distance readings from his car at the start and end of a journey.

Start of journey

1	2	4	6	8
---	---	---	---	---

 miles

End of journey

1	2	8	4	5
---	---	---	---	---

 miles

Myles knows that the cost of petrol for this journey is 13p per mile.

Work out the total cost of the petrol used for this journey.
Give your answer in pounds.

$$12845 - 12468$$

This works out that the journey was 377 miles

$$377 \times 0.13$$

Multiplying the number of miles by the cost of each mile works out the cost of the petrol used for this journey. The 13p is converted to £0.13 by dividing it by 100 as there is 100p in £1

£.....49.01

(Total for Question 7 is 4 marks)

- 8 Safiya wants to hire a van.
She uses this rule to work out the cost of hiring a van for a number of days.

Cost = £45 × number of days

Safiya is going to hire the van for 7 days.

Work out the cost.

$$45 \times 7$$

Cost = £45 × 7 days

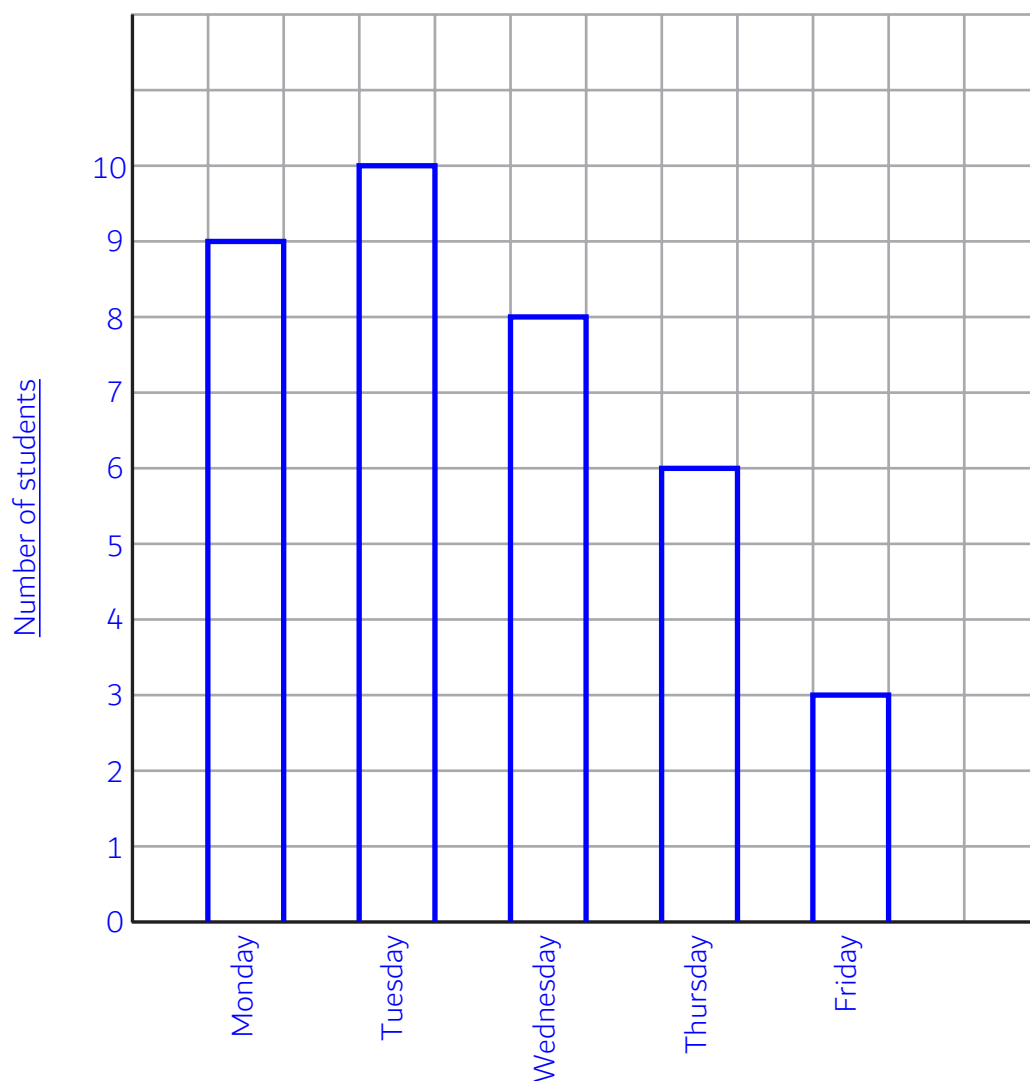
£.....315

(Total for Question 8 is 2 marks)

- 9 The table shows information about the number of students who arrived late at school each day one week.

	Number of students
Monday	9
Tuesday	10
Wednesday	8
Thursday	6
Friday	3

On the grid, draw a bar chart for this information.



(Total for Question 9 is 3 marks)

10 Here is part of a bus timetable between Wigan and Bolton.

Wigan	07 20		07 40		07 55
Blackrod	07 49		08 09		08 24
Horwich	08 00	08 14	08 20	08 29	08 36
Lostock	08 09	08 20	08 29	08 37	08 44
Park Road	08 14	08 34	08 41	08 48	08 58
Bolton	08 32	08 51	08 58	09 05	09 15

(a) How many minutes should the 07 20 bus take to go from Wigan to Lostock?

$$8^{\circ}9' - 7^{\circ}20' = 0^{\circ}49'0''$$

Working out the difference between the times by entering them in sexagesimal notation

49 minutes

(2)

Alison goes from Blackrod to Bolton by bus.

One day Alison leaves her house at 08 00

She takes 7 minutes to walk to the bus stop in Blackrod.

She takes 15 minutes to walk from the bus stop in Bolton to work.

Alison needs to be at work for 09 20

(b) Will Alison get to work for 09 20?

You must show how you get your answer.

$$8^{\circ}58' + 0^{\circ}15' = 9^{\circ}13'0''$$

7 minutes after 08 00 is 08 07, so she can catch the 08 09 from Blackrod and arrive in Bolton at 08 58. Working out 15 minutes after 08 58 using sexagesimal notation on the calculator and writing what was written into the calculator and the answer it gives. This means she will arrive at work at 09 13

Yes

09 13 is before 09 20 so she will arrive at work for 09 20

(3)

(Total for Question 10 is 5 marks)

- 11 214 people go on a school trip.
The people on the trip are either adults or children.

There are 14 adults on the trip.
35% of the children on the trip are wearing a hat.

Find the number of children on the trip who are **not** wearing a hat.

$$214 - 14$$

Subtracting the 14 adults from the 214 people works out that there are 200 children

$$200 \times \frac{35}{100}$$

Percentage is out of 100 so putting the 35 over 100 converts it into a fraction. When it is multiplied by the 200 it finds 35%. So 70 children are wearing a hat

$$200 - 70$$

Subtracting the 70 children wearing a hat from the 200 children leaves 130 children who are not wearing a hat

.....130

(Total for Question 11 is 4 marks)

12 (a) Work out $\frac{5}{8}$ of 132

$$\frac{5}{8} \times 132$$

'Of' means to multiply

82.5

(2)

(b) Write the following fractions in order of size.
Start with the smallest fraction.

$$\frac{3}{8} \quad \frac{9}{32} \quad \frac{1}{4} \quad \frac{21}{64}$$

37.5% 28.125% 25% 32.8125%

Converting them all into percentages by multiplying them by 100 makes them easier to compare

$$\frac{1}{4}, \frac{9}{32}, \frac{21}{64}, \frac{3}{8}$$

(2)

(Total for Question 12 is 4 marks)

13 A shop has two different special offers on milk.



75p

Pay for 2 bottles
get 1 bottle free



£1.28

Pay for 1 bottle
get 1 bottle half price

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

$$0.75 \times 2 = 1.50$$

This works out that when the 2 pints offer is used once, it costs £1.50. There is 100p in £1 so dividing the 75p by 100 converts it into £0.75

$$2 \times 3 = 6$$

This works out that when the 2 pints offer is used once, there is 6 pints

$$1.50 \div 6 = 0.25$$

This works out that the 2 pint offer costs £0.25 per pint

$$1.28 \div 2$$

This works out that the price of the half price bottle using the 4 pints offer is £0.64

$$1.28 + 0.64 = 1.92$$

Adding the price of the half price bottle to the first bottle when using the 4 pints offer works out that using the offer once costs £1.92

$$4 \times 2 = 8$$

This works out that when the 4 pints offer is used once, there is 8 pints

$$1.92 \div 8 = 0.24$$

This works out that the 4 pints offer costs £0.24 per pint

4 pints

As it cost less per pint

(Total for Question 13 is 4 marks)

14 (a) Simplify $4c + 7d + 3c - d$

Collecting like terms. $4c + 3c = 7c$. $7d - d = 6d$

$$7c + 6d$$

(2)

(b) Solve $5(2m - 6) = 40$

$$2m - 6 = 8$$

Dividing both sides by 5 eliminates the 5 on the left side

$$2m = 14$$

Adding 6 to both sides eliminates the -6 on the left side and gets the m term on its own

Dividing both sides by 2 eliminates the 2 on the left and gets m on its own

$$m = 7$$

(3)

There are x sweets in a box.

There are y sweets in a packet.

(c) Write an expression, in terms of x and y , for the total number of sweets in 3 boxes and 2 packets.

Multiplying the number of boxes by the number of sweets in each box works out that there are $3x$ sweets in 3 boxes. Multiplying the number of packets by the number of sweets in each packet works out that there are $2y$ sweets in 2 packets. Adding the number of sweets in 3 boxes and 2 packets expresses the total number of sweets

$$3x + 2y$$

(2)

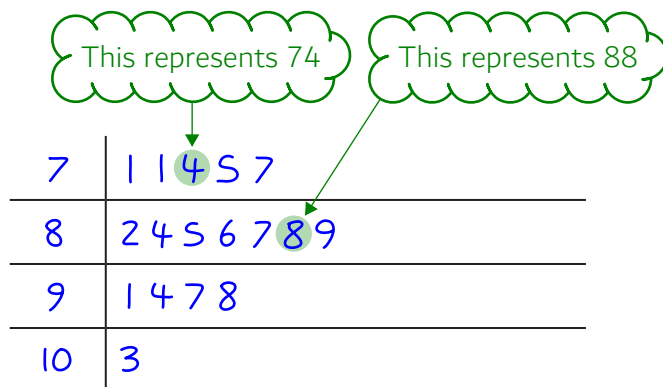
(Total for Question 14 is 7 marks)

- 15 Hetvi asked her friends how many stickers they each have in their collection. Here are her results.

~~77~~ ~~86~~ ~~94~~ ~~87~~ ~~71~~ ~~98~~
~~74~~ ~~103~~ ~~71~~ ~~85~~ ~~82~~ ~~84~~
~~97~~ ~~91~~ ~~88~~ ~~89~~ ~~75~~

- (a) Show this information in a stem and leaf diagram.

Starting with the smallest, putting the numbers in order onto the stem and leaf diagram. Crossing out the numbers as they go



Key:

$$7|1 = 71$$

(3)

- (b) Find the median number of stickers.

The numbers in the stem and leaf diagram are already in order. Reading from either end until the one in the middle is found. This is 86

86

(2)

(Total for Question 15 is 5 marks)

- 16 Water flows through each of the pipes that fill a lake at the same rate.
It takes 4 of the pipes 12 hours to fill the lake.

Work out how many hours it would take 6 pipes to fill $\frac{1}{4}$ of the lake.

4×12

Multiplying the 4 taps by the 12 hours they each do works out that there is 48 hours worth of work to be done to fill the lake

$\frac{1}{4} \times 48$

Doing $\frac{1}{4}$ of the 48 hours worth of work to fill the lake works out that it is 12 hours worth of work to fill $\frac{1}{4}$ of the lake

$12 \div 6$

Dividing the 12 hours worth of work to fill $\frac{1}{4}$ of the lake by the 6 taps works out that each would do 2 hours

..... 2 hours

(Total for Question 16 is 3 marks)

17 The table shows information about the heights of 80 teenagers.

Height (h cm)	Frequency
$150 < h \leq 160$	8
$160 < h \leq 170$	14
$170 < h \leq 180$	24
$180 < h \leq 190$	30
$190 < h \leq 200$	4

Midpoint Total

$$\times 155 = 1240$$

$$\times 165 = 2310$$

$$\times 175 = 4200$$

$$\times 185 = 5550$$

$$\times 195 = \underline{780}$$

$$14080 \div 80$$

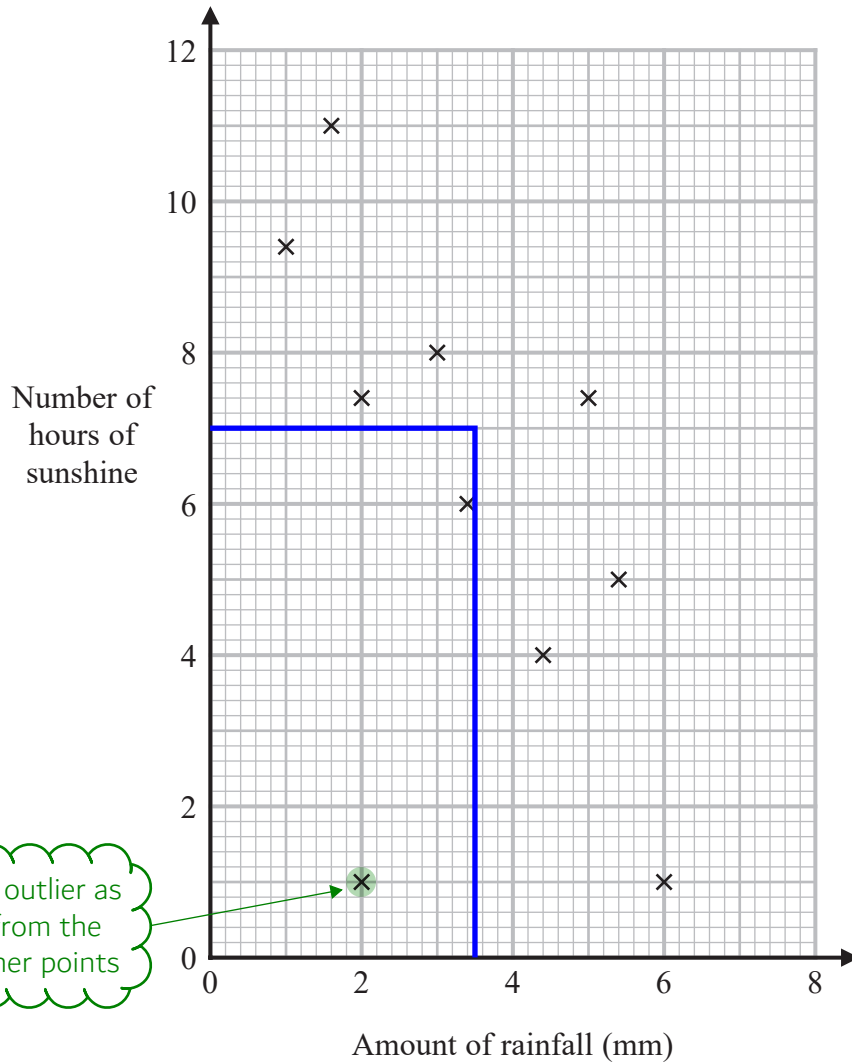
Work out an estimate for the mean height of the teenagers.

Mean = total \div number, where total is the total height of all the teenagers and number is the number of teenagers. The midpoints are used to estimate all the heights in each category. Each category has a difference of 10cm between their greatest and smallest heights and $10 \div 2 = 5$ so adding 5 to each of the smallest heights in each category works out the midpoint of each category. Multiplying the frequencies by the midpoints works out an estimate of the total height of each category. Adding all of these totals together estimates the total height of the teenagers. Dividing this by the 80 teenagers works out an estimate of the mean

..... 176 cm

(Total for Question 17 is 3 marks)

- 18 The scatter graph shows information about the amount of rainfall, in mm, and the number of hours of sunshine for each of ten English towns on the same day.



This point is an outlier as it is far away from the trend of the other points

One of the points is an outlier.

- (a) Write down the coordinates of this point.

(2 , 1)
(1)

- (b) Ignoring the outlier, describe the relationship between the amount of rainfall and the number of hours of sunshine.

Negative correlation

As the rainfall increases, the sunshine generally decreases. This is negative correlation

(1)

On the same day in another English town there were 7 hours of sunshine.

- (c) Using the scatter graph, estimate the amount of rainfall in this town on this day.

Drawing across from 7 hours of sunshine to a point which is roughly in the middle of the surrounding data points then down to the number of hours of rainfall. It is halfway between 3 and 4 so is 3.5

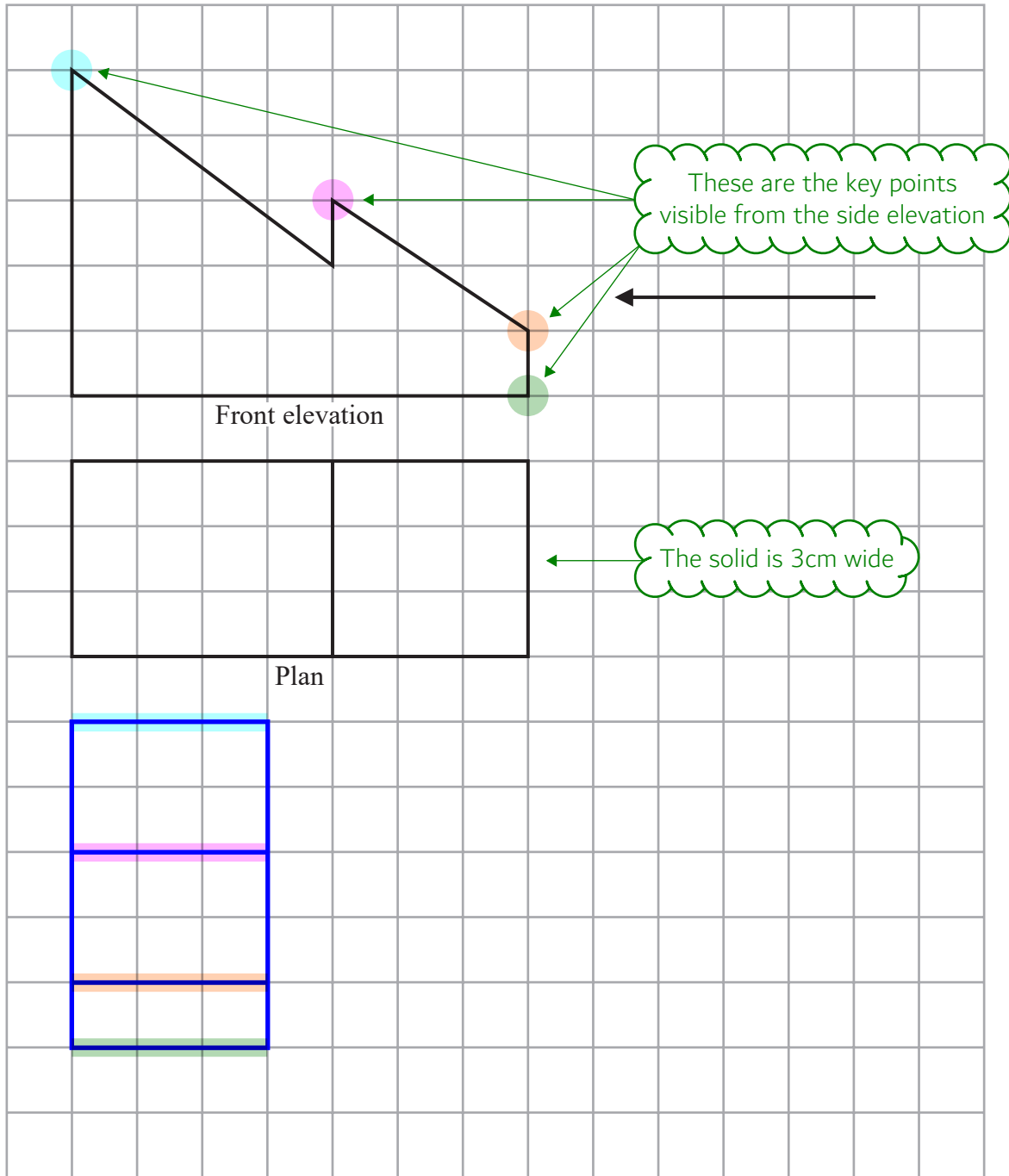
3.5 mm

(2)

(Total for Question 18 is 4 marks)

19 The front elevation and the plan of a solid are shown on the grid.

On the grid, draw the side elevation of the solid from the direction of the arrow.



(Total for Question 19 is 2 marks)

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20 Here are the first five terms of an arithmetic sequence.

7 13 19 25 31

(a) Find an expression, in terms of n , for the n th term of this sequence.

The sequence increases by 6 between each term so must involve $6n$.
Going backward in the sequence finds that the 0th term (the one before the first term) would be 1 so the n th term must be $6n + 1$

$$\frac{6n+1}{(2)}$$

The n th term of a different sequence is $8 - 6n$

(b) Is -58 a term of this sequence?

You must show how you get your answer.

$$8 - 6n = -58$$

Setting the expression of the n th term equal to the -58 then rearranging to find n to find out what term it would be

$$-6n = -66$$

Subtracting 8 from both sides gets the n term on its own

$$n = 11$$

Dividing both sides by -6 gets n on its own

Yes

n is a whole number so -58 must be in the sequence. -58 is the 11th term

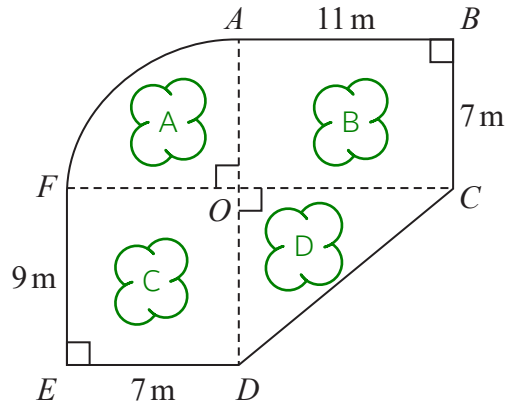
(Total for Question 20 is 4 marks)

21 The diagram shows a plan of Jason's garden.

$ABCO$ and $DEFO$ are rectangles.

CDO is a right-angled triangle.

AFO is a sector of a circle with centre O and angle $AOF = 90^\circ$



Jason is going to cover his garden with grass seed.

Each bag of grass seed covers 14 m^2 of garden.

Each bag of grass seed costs £10.95

Work out how much it will cost Jason to buy all the bags of grass seed he needs.

$$11 \times 7 = 77$$

Area of rectangle B. Area of rectangle = length \times width

$$9 \times 7 = 63$$

Area of rectangle C. Area of rectangle = length \times width

$$\frac{1}{2} \times 11 \times 9 = 49.5$$

Area of triangle D. Area of triangle = $\frac{1}{2} \times$ base \times height

$$\frac{1}{4} \times \pi \times 7^2 = \frac{49}{4} \pi$$

Area of the sector of a circle A. Area of circle = $\pi \times$ radius².
The radius is 7m. The sector is $\frac{1}{4}$ of a circle

$$77 + 63 + 49.5 + \frac{49}{4} \pi$$

Adding all the areas of the shapes works out that the area of the garden is 227.98451 m^2

$$227.9... \div 14$$

Dividing the area of the garden by the 14 m^2 covered by each bag of grass seed works out that 16.2... bags of grass seed are needed

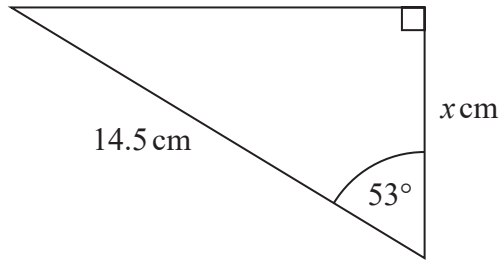
$$17 \times 10.95$$

Rounding the number of bags of grass seed up to the next whole number as there needs to be a whole number of bags and 16 would not be enough. Multiplying 17 bags by the cost of each bag works out the cost of all the bags

£.....186.15.....

(Total for Question 21 is 5 marks)

22



Work out the value of x .

Give your answer correct to 3 significant figures.

SOH CAH TOA

Writing out SOH CAH TOA as formula triangles. 14.5cm is the hypotenuse so ticking H and we are looking for the adjacent so ticking A

$\cos(53) \times 14.5$

There are two ticks on the CAH formula triangle so this one can be used. Covering over A tells us that adjacent = cos of the angle x hypotenuse

The answer of 8.726... is rounded to 3 significant figures $\rightarrow x = 8.73$

(Total for Question 22 is 2 marks)

23 Ella invests £7000 for 2 years in an account paying compound interest.

In the first year, the rate of interest is 3%

In the second year, the rate of interest is 1.5%

Work out the value of Ella's investment at the end of 2 years.

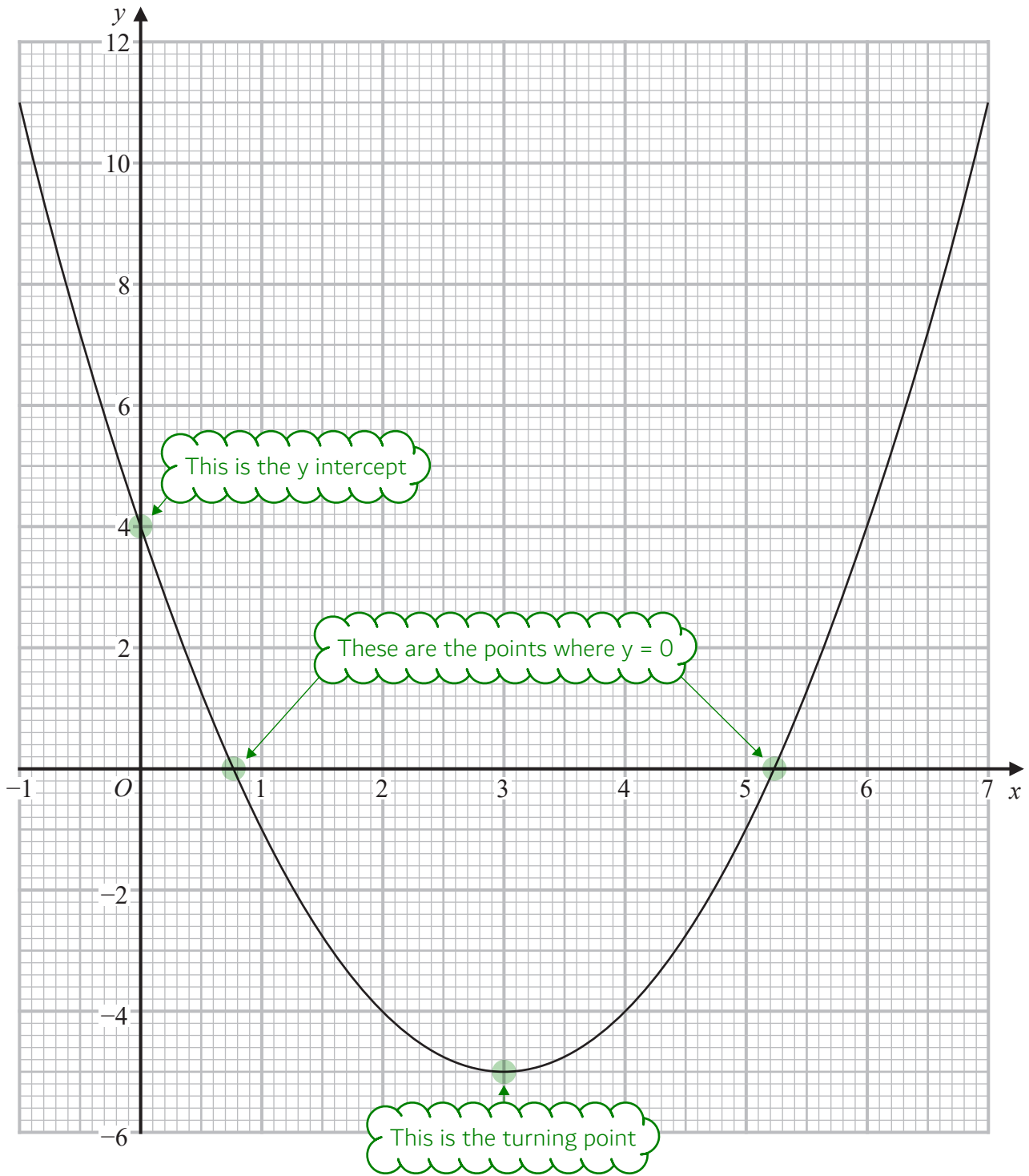
$$7000 \times \frac{100+3}{100} \times \frac{100+1.5}{100}$$

Adding the 3% to 100% expresses the percentage it rises to when increased by 3%. Putting this over 100 converts it into a fraction. When multiplying by this fraction, it increases the amount by 3%. Doing the same for the 1.5%

£ 7318.15

(Total for Question 23 is 3 marks)

24 Here is the graph of $y = x^2 - 6x + 4$



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(a) Write down the y intercept of the graph of $y = x^2 - 6x + 4$

4

(1)

(b) Write down the coordinates of the turning point of the graph of $y = x^2 - 6x + 4$

(3 , -5)

(1)

(c) Use the graph to find estimates for the roots of $x^2 - 6x + 4 = 0$

It is basically asking what x is when $y = 0$

0.75, 5.25

(2)

(Total for Question 24 is 4 marks)

25 (a) Find the value of the reciprocal of 0.8

$$1/0.8 = 1.25$$

Reciprocal basically means '1 over'

$$\dots\dots\dots 1.25$$

(1)

$x = 4700$ correct to 2 significant figures.

(b) Complete the error interval for x .

$$4700 \pm \frac{100}{2}$$

Adding and subtracting half of the resolution works out the upper and lower bound. The resolution is 100 as this is the value of the place the 2nd significant figure (the 7) is in

$$\dots\dots\dots 4650 \leq x < \dots\dots\dots 4750$$

(2)

(Total for Question 25 is 3 marks)

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- 26 The population of a town increased by 9% between 2018 and 2019
The population in 2019 was 165 680

Calculate the population in 2018

$$165680 \div 109$$

Let 100% be the population in 2018. It has increased to 109% as it has increased by 9%. Dividing by 109 finds 1% of the population in 2018

$$1520 \times 100$$

Multiplying the value of 1% by 100 works out the 100%, which is the population in 2018

.....152000

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS