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)

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 ▶

P68722A

B:1/1/1/1/1/1/

P 6 8 7 2 2 A 0 1 2 4

Pearson

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

- 7 - 2 - 1 0 7 (1)

(Total for Question 1 is 1 mark)

2 Write 37% as a fraction.

$37\% = \frac{37}{100}$

$\frac{37}{100}$ (1)

(Total for Question 2 is 1 mark)

3 Write down the 7th odd number.

Odd number = number that are not divisible by 2

1, 3, 5, 7, 9, 11, (13) ← 7th odd number

13 (1)

(Total for Question 3 is 1 mark)

4 Change 53 centimetres to millimetres.

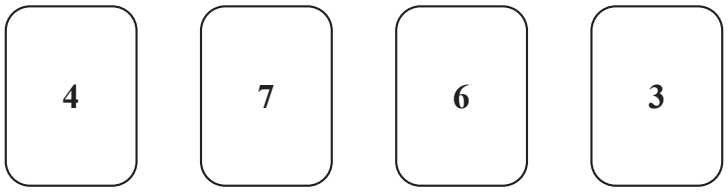
53 cm (×10) mm = 530 mm

cm ⇄ mm (×10, ÷10)

530 (1) millimetres

(Total for Question 4 is 1 mark)

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.

to get even number, either 4 or 6 will be at the end.

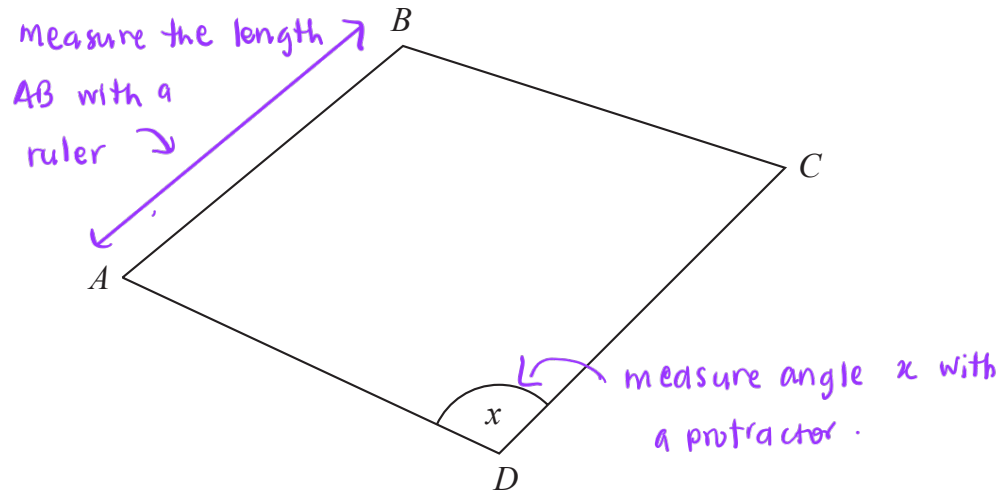
Smallest number = 3 _ 7 _

↖ in this case, 6 needs to be at the end to get the smallest number

3476 (1)

(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 (1) centimetres

(1)

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

110 (1) °

(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.

Finding the total distance of the journey :

End of journey - Start of journey = 12 845 - 12 468
= 377 miles (1)

Finding the total cost of petrol used throughout the journey

377 miles x 13 p per mile = 4901 p (1) 1 £ = 100 p

= 4901 p ÷ 100 (1)

= £ 49.01 (1)

£ 49.01

(Total for Question 7 is 4 marks)

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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.

Cost of hiring a van = £45 x 7 (1)

= £ 315 (1)

£ 315

(Total for Question 8 is 2 marks)

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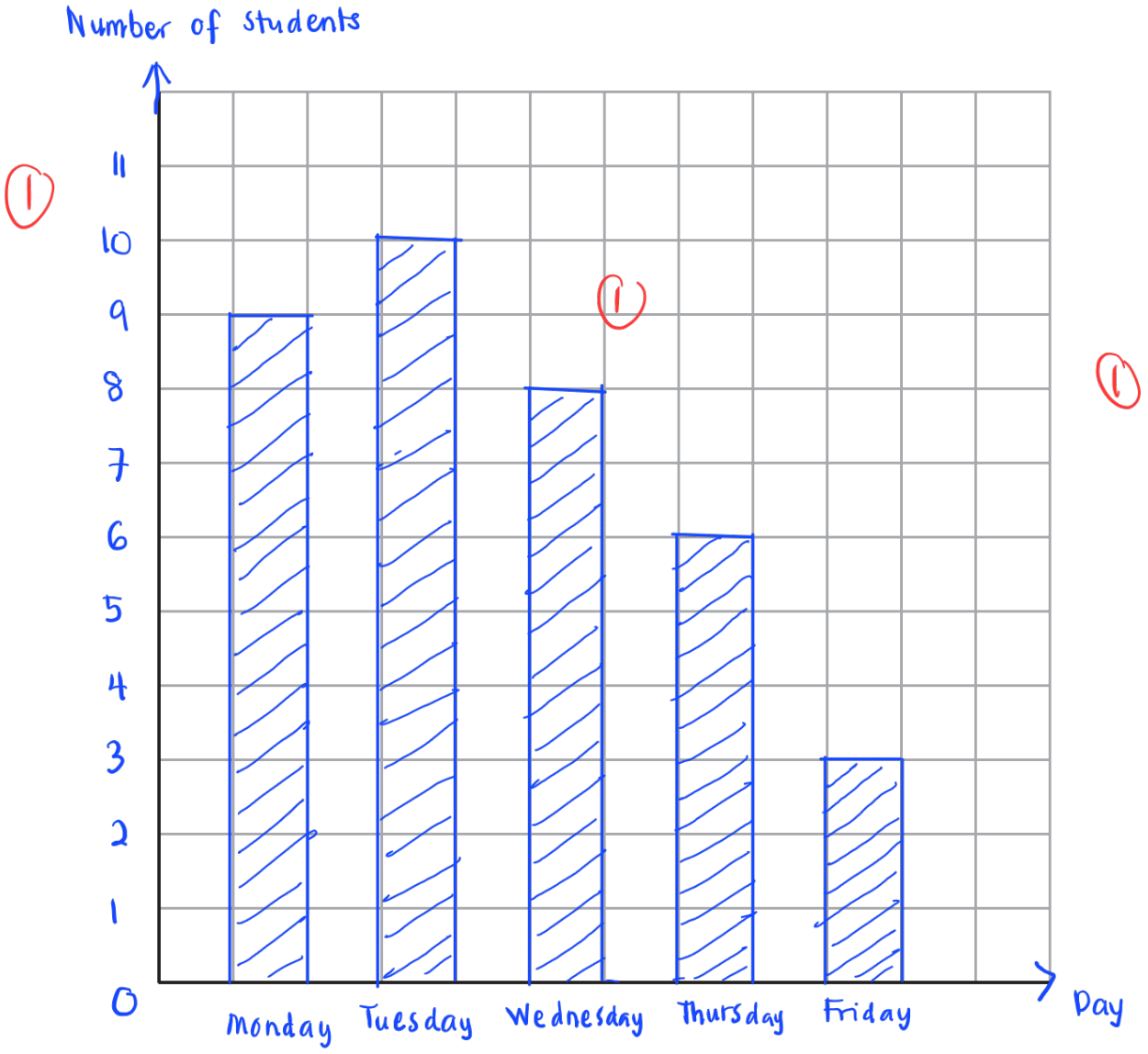
9 The table shows information about the number of students who arrived late at school each day one week.

	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	0720		0740		0755
Blackrod	0749		0809		0824
Horwich	0800	0814	0820	0829	0836
Lostock	0809	0820	0829	0837	0844
Park Road	0814	0834	0841	0848	0858
Bolton	0832	0851	0858	0905	0915

(a) How many minutes should the 0720 bus take to go from Wigan to Lostock?

7 6
~~08~~ : ~~09~~
− 07 : 20
0 : 49

The bus will be at Lostock at 0809.

From Wigan to Lostock = 08:09 − 07:20 (1)
= 0:49
= 49 minutes

49 (1) ..... minutes

(2)

Alison goes from Blackrod to Bolton by bus.

One day Alison leaves her house at 0800
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 0920

(b) Will Alison get to work for 0920?
You must show how you get your answer.

House → Blackrod bus stop → Bolton bus stop → Work

(1) Alison arrives at Blackrod bus stop at: 0800 + 7 minutes = 0807 (1)

(2) Alison boards the bus at 0809 (nearest one to 0807) (1)

(3) Alison arrives at Bolton bus stop at 0858

(4) Alison walks to work for 15 minutes. She arrives at work at: 0858 + 15 min = 0913

(3)

Yes. Alison arrives before 0920. (1)

(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.

Finding the number of children on the trip :

Number of Children = Total - number of adult

= 214 - 14 = 200 (1)

Finding percentage of children who are not wearing a hat.

100% - 35% = 65% (1)

Number of children not wearing hat $\frac{65}{100} \times 200 = 130$ (1)

130 (1)

(Total for Question 11 is 4 marks)

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

16.5
$8\overline{)132}$
-8
52
-48
40

$^{2}16.5$
$\times \quad 5$
82.5

$\frac{5}{8} \times 132$ (1)

$= 82.5$ (1)

82.5

(2)

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

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

To compare, use the same denominator for all fractions

$\frac{3 \times 8}{8 \times 8} = \frac{24}{64}$ $\frac{1 \times 16}{4 \times 16} = \frac{16}{64}$

$\frac{9 \times 2}{32 \times 2} = \frac{18}{64}$ $\frac{21}{64}$ (1)

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

(2)

(Total for Question 12 is 4 marks)

13 A shop has two different special offers on milk.

MILK A

75p

Pay for 2 bottles
get 1 bottle free

MILK B

£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.

MILK A : pints : $2 \times 2 + 2 = 6$

price : $2 \times 75p$: £1.5 (1)

MILK B : pints : $4 \times 1 + 4 = 8$

price : £1.28 + £0.64 = £1.92 (1)

$$6 \overline{)1.5} = 0.25$$

-0

1.5

-1.2

-30

$$8 \overline{)1.92} = 0.24$$

-1.6

32

-32

Finding price per pints for both milk :

milk A : $\frac{£1.5}{6}$ = £0.25 per pint (1)

milk B : $\frac{£1.92}{8}$ = £0.24 per pint

∴ Milk B (4 pints) offer better value for money (1)

(Total for Question 13 is 4 marks)

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

Group c and d terms together

$4c + 3c + 7d - d$

$\therefore 7c + 6d$ (1)

$7c + 6d$ (1)

(2)

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

$\frac{5(2m - 6)}{5} = \frac{40}{5}$ (1) — divide both sides by 5

$2m - 6 = 8$

$2m = 14$ (1) — isolate m term to one side

$m = 7$ (1)

$m =$ 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.

2 packets of sweets : $2y$

3 boxes of sweets : $3x$ (1)

Total number of sweets : $3x + 2y$ (1)

$3x + 2y$

(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.

7	1 1 4 5 7
8	2 4 5 6 7 8 9
9	1 4 7 8
10	3

(2) (1)

Key: eg 10 | 3 represents 103 (1)

(3)

(b) Find the median number of stickers.

Number of terms = 17

Median = $\frac{17+1}{2}$ = 9th term

median for odd total of numbers: $\frac{n+1}{2}$

∴ 86 (1)

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.

Number of pipes and time taken are inversely proportional :

Fill lake : 4 pipes = 12 hours (×4) (1)

÷4 ↓ 1 pipe = 48 hours (÷6) (1)

×6 ↓ 6 pipes = 8 hours

$\frac{1}{4}$ of fill lake : $\frac{1}{4}$ of 8 hours = 2 hours (1)

2 hours

(Total for Question 16 is 3 marks)

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

Midpoint : $\frac{\text{upper limit} - \text{lower limit}}{2}$

Midpoint	Height (h cm)	Frequency
155	$150 < h \leqslant 160$	8
165	$160 < h \leqslant 170$	14
175	$170 < h \leqslant 180$	24
185	$180 < h \leqslant 190$	30
195	$190 < h \leqslant 200$	4

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

Finding total height of the teenagers :

$(155 \times 8) + (165 \times 14) + (175 \times 24) + (185 \times 30) + (195 \times 4)$

$= 1240 + 2310 + 4200 + 5500 + 780$ (1)

$= 14080$

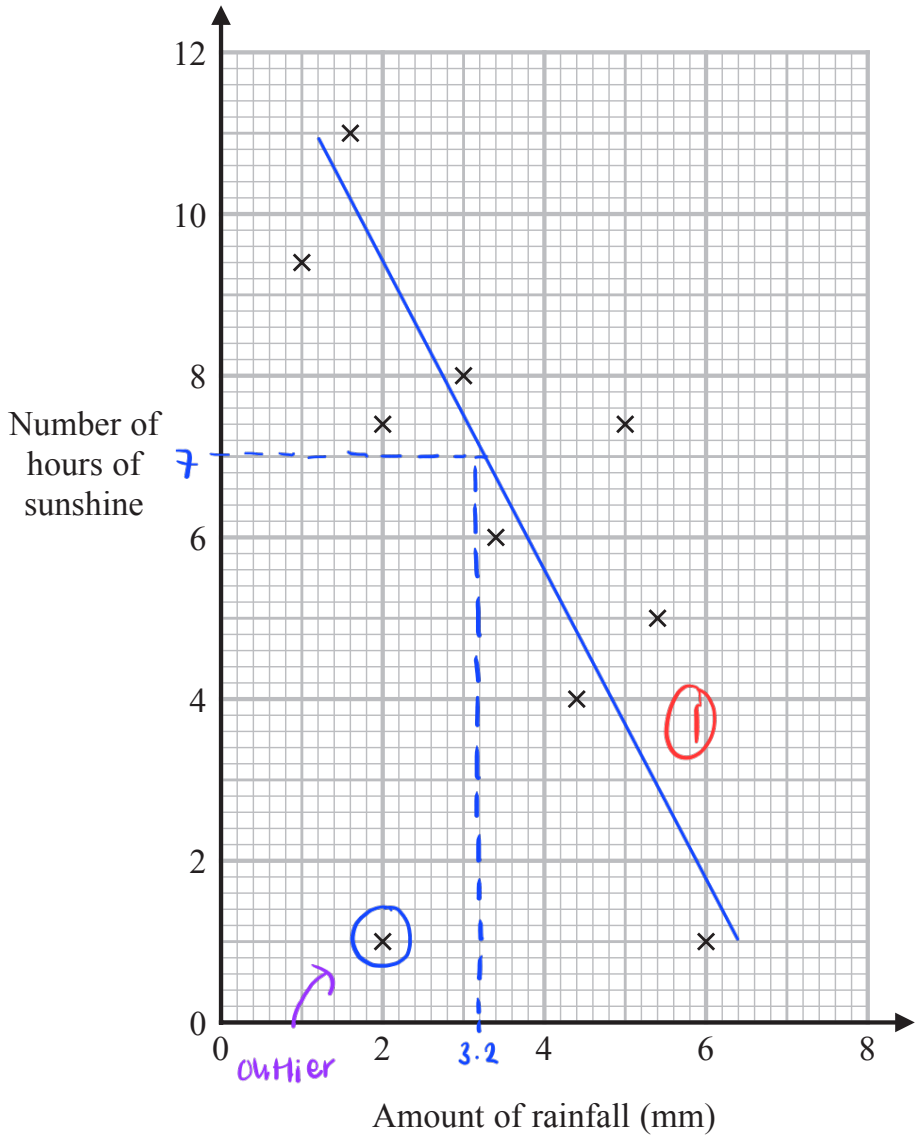
Finding mean height of the teenagers :

$= \frac{14080}{80} = 176$ (1)

176 (1) ..... 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.



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.

Amount of rainfall decreases as number of hours of sunshine increases (1)

(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.

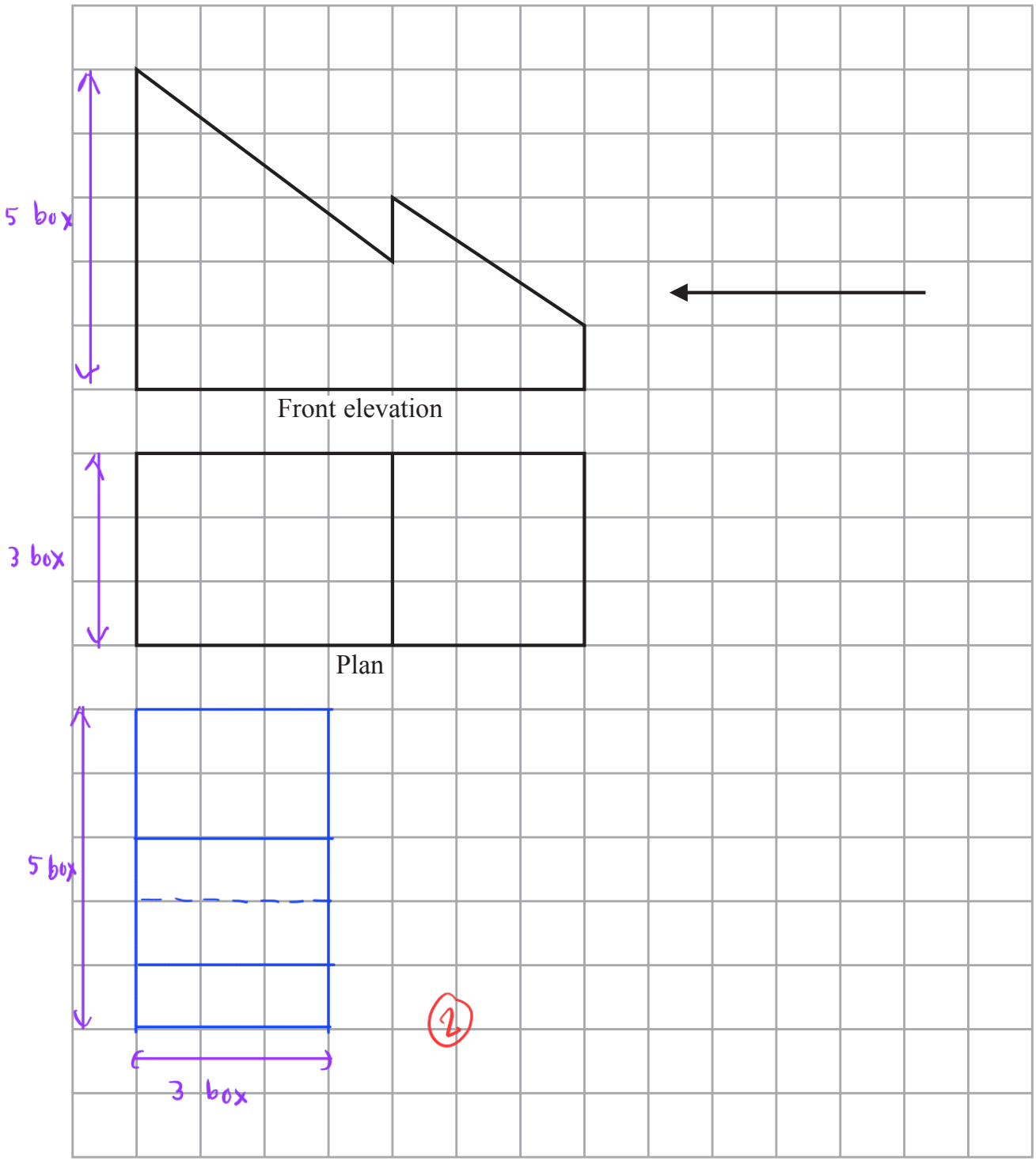
3.2 (1) mm

(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)

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

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

The coefficient of n is the common difference between consecutive terms.

e.g First term = 7

$6n = 6(1) \neq 7$

$6n+1 = 6(1)+1 = 7$

adding 1 will give us 7 as first term

$6n + 1$ (2)

(2)

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

(b) Is -58 a term of this sequence?
You must show how you get your answer.

$8 - 6n = -58$ (1)

$6n = 58 + 8$

$n = \frac{66}{6}$

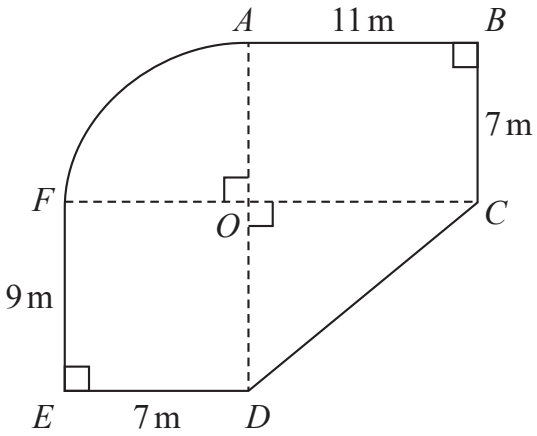
$= 11$

∴ Yes, -58 is the 11^{th} term of the sequence. (1) (2)

(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°



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.

Finding the area of all sections :

Area of ABCO = 11 m × 7 m = 77 m^2

Area of DEFO = 9 m × 7 m = 63 m^2

Area of AOF = $\frac{1}{4} \times \pi \times (7\text{ m})^2 = 38.4845\text{ m}^2$

Area of COD = $\frac{1}{2} \times 11\text{ m} \times 9\text{ m} = 49.5\text{ m}^2$ (1)

Finding total area of all sections :

$77 + 63 + 49.5 + 38.4845 = 227.9845\text{ m}^2$ (1)

Finding total bags of grass to cover his garden :

$\frac{227.9845\text{ m}^2}{14\text{ m}^2} = 16.28$ (1)

∴ He needs to buy 17 bags of grass (round up)

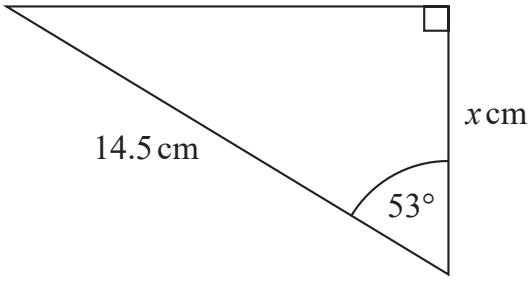
Finding total cost :

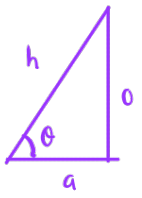
17 × £10.95 = £186.15 (1)

£ 186.15 (1)

(Total for Question 21 is 5 marks)

22





$\cos\theta = \frac{a}{h}$

$\sin\theta = \frac{o}{h}$

$\tan\theta = \frac{o}{a}$

choose method which has both a and h. (cos)

Work out the value of x.
Give your answer correct to 3 significant figures.

$\cos 53^\circ = \frac{x}{14.5}$

$x = 14.5 \cos 53^\circ$ (1)

$= 8.73$ (1)

$x =$ 8.73

(Total for Question 22 is 2 marks)

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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.

Start of first year = £ 7000

End of first year = £ $7000 + \frac{3}{100} \times 7000$

$7000 + 210 = 7210$ (1)

Start of second year = £ 7210

End of second year = £ $7210 + \frac{1.5}{100} \times 7210$

$7210 + 108.15$ (1)

$= 7318.15$ (1)

£ 7318.15

(Total for Question 23 is 3 marks)

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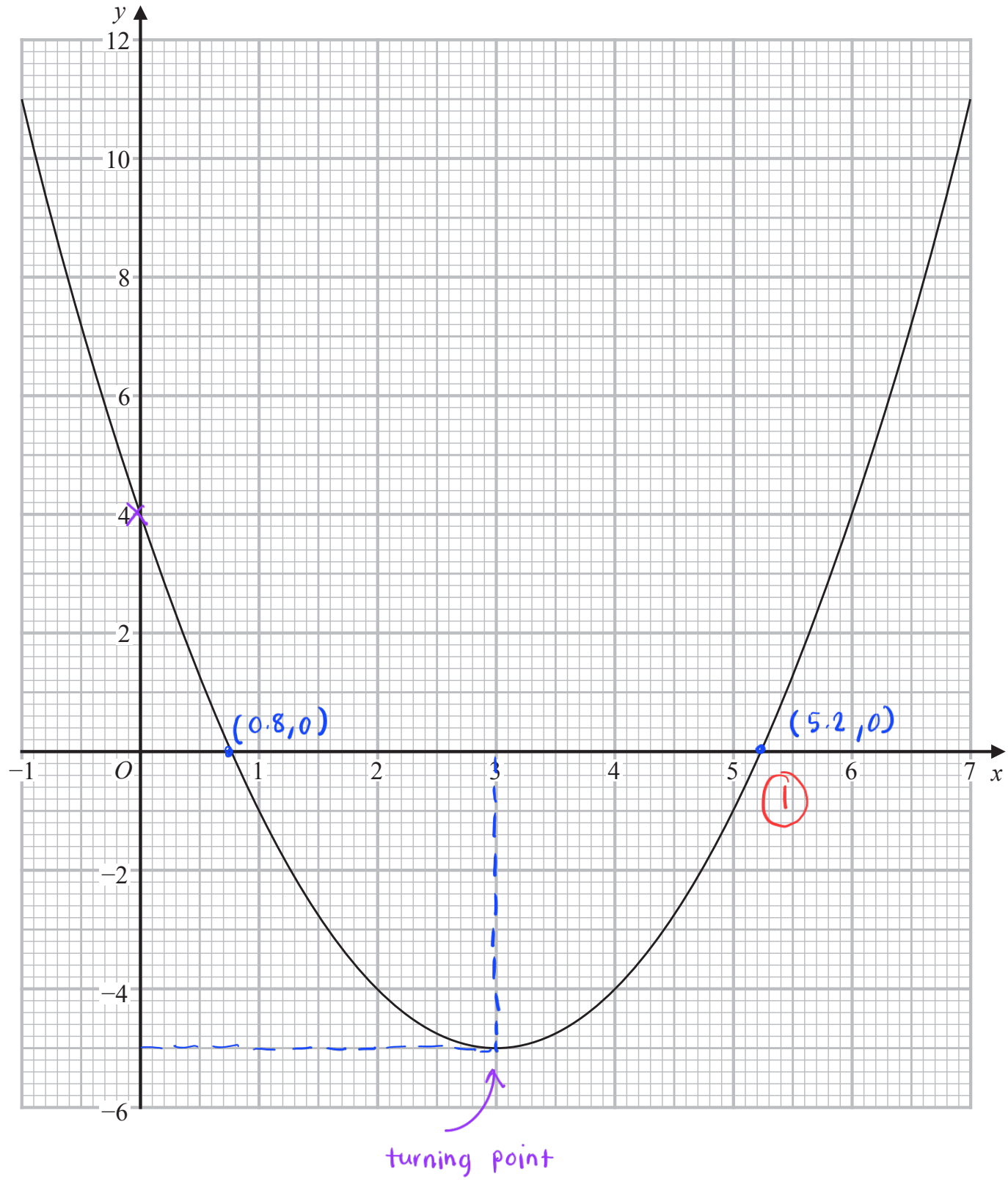
24 Here is the graph of $y = x^2 - 6x + 4$



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

Substituting $x = 0$ will give us 4

4 (1)

(1)

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

(3 , -5) (1)

(1)

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

0.8 and 5.2 (1)

(2)

(Total for Question 24 is 4 marks)

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

Reciprocal $= \frac{1}{x}$

$\frac{1}{0.8} = 1.25$

1.25 (1)

.....

(1)

$x = 4700$ correct to 2 significant figures.

(b) Complete the error interval for x.

4650 (1) $\leqslant x <$ 4750 (1)

.....

(2)

(Total for Question 25 is 3 marks)

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

Let:
Population of 2018 = x

Population of 2019 = Population of 2018 + $\frac{9}{100}$ (population of 2018)

$165\,680 = x + 0.09x$

$1.09x = 165680$

$x = 165680 \div 1.09$ (1)

$x = 152\,000$ (1)

152 000

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

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