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GCSE MATHS

Number

Edexcel 1MA1 | Subtopic collection Topic 01

Place value, ordering and order of operations

Higher tier

Past paper question booklet

162	2003-2025	Higher
question groups	available papers	tier

Before you begin

1. Show working and use units where appropriate.
2. Use extra paper if you need more space.
3. Print at actual size (100%) for measurement questions.

Name _____ **Date** _____

Whole questions are retained for context; some parts cover other points. Legacy sources are labelled.

1. Using the information that

$$97 \times 123 = 11\,931$$

write down the value of

(i) 9.7×12.3

.....

(ii) $0.97 \times 123\,000$

.....

(iii) $11.931 \div 9.7$

.....

(3)

16. Work out

(i) 4^0

.....

(ii) 4^{-2}

.....

(iii) $16^{\frac{3}{2}}$

.....

(3)

18. Work out

$$\frac{(5+\sqrt{3})(5-\sqrt{3})}{\sqrt{22}}$$

Give your answer in its simplest form.

.....

(3)

Page Total

7. Work out $5\frac{2}{3} - 2\frac{3}{4}$

.....

(3)

1. Use your calculator to work out the value of

$$\frac{(7.91-\sqrt[3]{81})\times 4.32}{6.23+1.491}$$

Give your answer correct to 3 significant figures.

.....

(3)

Question 06

Blank

8. Work out $3\frac{2}{5} - 1\frac{3}{4}$

.....

Q8

(Total 3 marks)

2. Kate buys 2 lollies and 5 choc ices for £6.50
Pete buys 2 lollies and 3 choc ices for £4.30

Work out the cost of one lolly.
Give your answer in pence.

..... pence
(Total 3 marks)

Blank

Q2

Blank

10. (a) Write as a power of 7

(i) $7^8 \div 7^3$

.....

(ii) $\dfrac{7^2 \times 7^3}{7}$

.....

(3)

(b) Write down the reciprocal of 2

.....

(1) **Q10**

(Total 4 marks)

13. Work out $2\frac{2}{3} \times 1\frac{1}{4}$

Give your answer in its simplest form.

.....

(Total 3 marks)

Q13

14. $-6 \leqslant 2y < 5$

y is an integer.
Write down all the possible values of y.

.....

Q14

(Total 3 marks)

Blank

7. Use the information that

$$322 \times 48 = 15\,456$$

to find the value of

(a) 3.22×4.8

.....

(1)

(b) 0.322×0.48

.....

(1)

(c) $15\,456 \div 4.8$

.....

(1)

Q7

(Total 3 marks)

5. Julie buys 19 identical calculators.
The total cost is £143.64

Work out the total cost of 31 of these calculators.

£ .....

(Total 3 marks)

Q5

15. Work out $\dfrac{4.6+3.85}{3.2^2-6.51}$

Write down all the numbers on your calculator display.

.....

(Total 2 marks)

blank

Q15

1. Using the information that

$$74 \times 234 = 17316$$

write down the value of

(a) 740×234

.....
(1)

(b) 74×2.34

.....
(1)

Q1

(Total 2 marks)

7. (a) Work out $\frac{3}{8}+\frac{1}{4}$

Give your answer in its simplest form.

.....
(2)

(b) Work out $\frac{2}{3}\times\frac{4}{5}$

.....
(2)

(c) Work out 423×12

You **must** show **all** your working.

.....
(3)

Q7

(Total 7 marks)

14. (a) Write down the value of 5^0

.....
(1)

(b) Write down the value of 2^{-1}

.....
(1)

Q14

(Total 2 marks)

21. Work out $(2 + \sqrt{3})(2 - \sqrt{3})$

Give your answer in its simplest form.

.....

Q21

(Total 2 marks)

20. The table gives information about the cost of the gas used by a family.

Month	Jan-Mar 2007	Apr-Jun 2007	Jul-Sep 2007	Oct-Dec 2007	Jan-Mar 2008	Apr-Jun 2008	Jul-Sep 2008
Cost of gas (in £)	124	63	24	121	136	71	32

(a) Work out the four-point moving averages for this information.
The first three have been worked out for you.

£83 ..... £86 ..... £88 ..... £ .....

(2)

(b) Use the moving averages to describe the trend.

.....

(1)

(Total 3 marks)

Q20

10. Work out 4.52×36

.....

Q10

(Total 3 marks)

11. There are 300 people in the cinema.

$\frac{1}{6}$ of the 300 people are boys.

$\frac{3}{10}$ of the 300 people are girls.

The rest of the people are adults.

Work out how many people are adults.

.....

(Total 4 marks)

Blank

Q11

16. Work out $3\frac{1}{4} \times 2\frac{2}{3}$

Give your answer in its simplest form.

Q16

.....

(Total 3 marks)

Blank

7. Paul drives 175 miles to a meeting.
His company pays him 37p for each mile.

Work out how much the company pays Paul.

£ .....

(Total 3 marks)

Q7

Blank

18. (a) Work out $2\frac{17}{20} - 1\frac{2}{5}$

.....

(3)

(b) Work out $2\frac{2}{3} \times 1\frac{3}{4}$

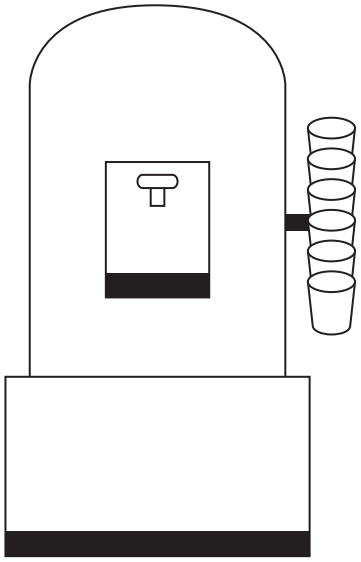
.....

(3)

Q18

(Total 6 marks)

18.



A water container has 19.5 litres of water in it.
A cup holds 210 m*l* of water.

At most 92 cups can be filled completely from the water container.
Explain why.
You must show all your working.

Q18

(Total 3 marks)

7 You can use this formula to change a temperature C, in °C, to a temperature F, in °F.

$$F = 1.8C + 32$$

(a) Use the formula to change 20°C into °F.

..... °F

(2)

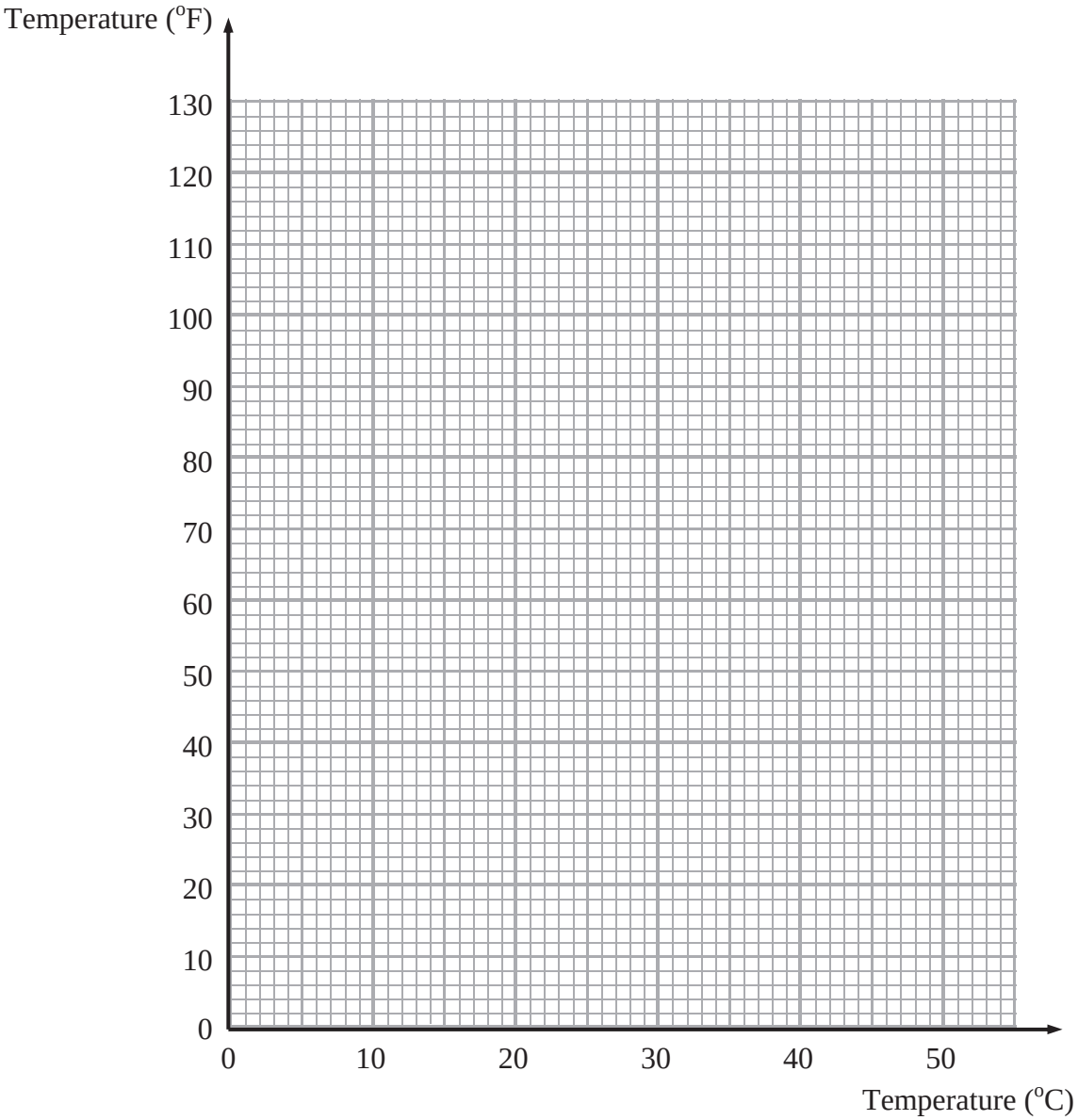
(b) On the grid opposite, draw a conversion graph that can be used to change between temperatures in °C and temperatures in °F.

(3)

(c) Use your graph to change 100 °F into °C.

..... °C

(1)



(Total for Question 7 is 6 marks)

11 A water trough is in the shape of a prism.

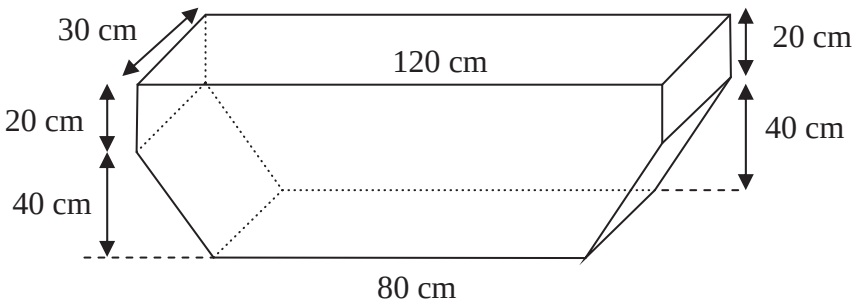


Diagram **NOT** accurately drawn

Hamish fills the trough completely.

Water leaks from the bottom of the trough at a constant rate.
2 hours later, the level of the water has fallen by 20 cm.

Water continues to leak from the trough at the same rate.

How many more minutes will it take for the trough to empty completely?

..... minutes

(Total for Question 11 is 6 marks)

4 Veena bought some food for a barbecue.
She is going to make some hot dogs.
She needs a bread roll and a sausage for each hot dog.

There are 40 bread rolls in a pack.
There are 24 sausages in a pack.

Veena bought exactly the same number of bread rolls and sausages.

(i) How many packs of bread rolls and packs of sausages did she buy?

..... packs of bread rolls

..... packs of sausages

(ii) How many hot dogs can she make?

..... hot dogs

(Total for Question 4 is 5 marks)

Question 28

12 Write down the value of

(i) 7^0

.....

(ii) 5^{-1}

.....

(iii) $9^{\frac{1}{2}}$

.....

(Total for Question 12 is 3 marks)

11. Peter, Tarish and Ben share £54

Tarish gets three times as much money as Peter.
Ben gets twice as much money as Tarish.

How much money does Ben get?

£ .....

(Total 3 marks)

Q11

Question 30

7. Bob has 120 beads.
The beads are either red or green.

Bob gives $\frac{3}{4}$ of the beads to his friend.

$\frac{2}{3}$ of the beads Bob now has are red.

Work out how many green beads Bob now has.

.....

(Total 3 marks)

Q7

8 The table shows information about midday temperatures.

Temperature (t °C)	Number of days
$10 \leqslant t < 15$	6
$15 \leqslant t < 20$	4
$20 \leqslant t < 25$	24
$25 \leqslant t < 30$	44
$30 \leqslant t < 35$	10
$35 \leqslant t < 40$	4

(a) Write down the modal class interval.

.....

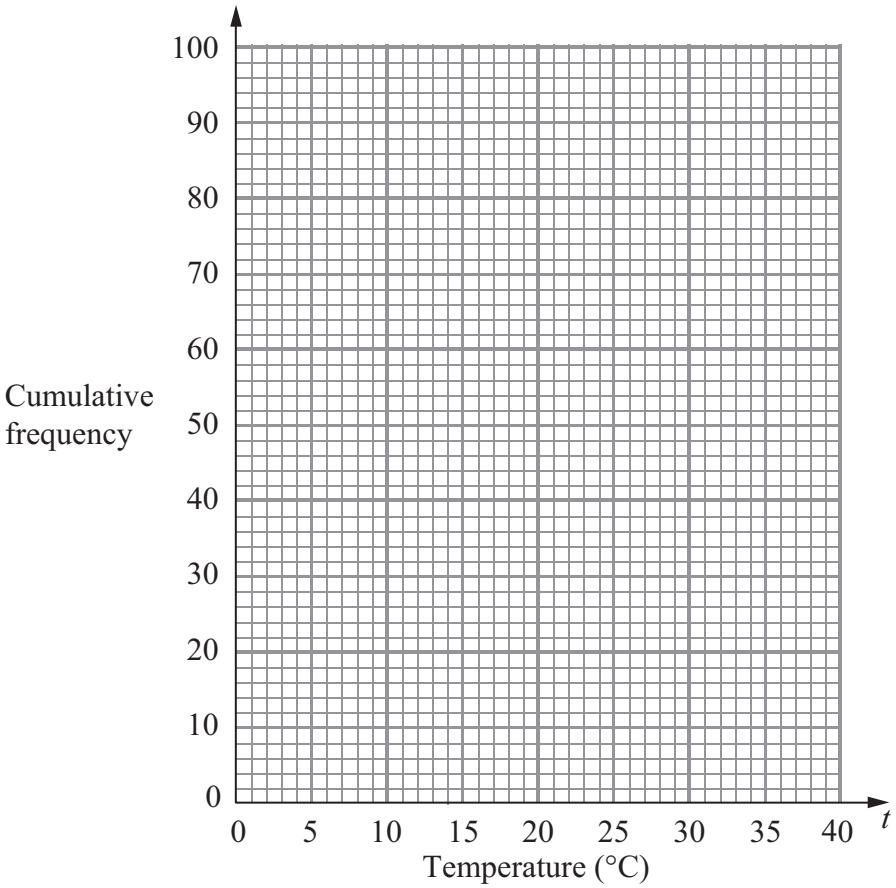
(1)

(b) Work out an estimate for the mean midday temperature.
Give your answer correct to 3 significant figures.

..... °C

(4)

(c) On the grid opposite, draw a cumulative frequency graph for the information from the table about the midday temperatures.



(3)

(d) Find estimates for the median **and** the interquartile range of these midday temperatures.

Median ..... °C

Interquartile range ..... °C

(3)

(Total for Question 8 is 11 marks)

Question 32

15 (a) Write down the value of $27^{\frac{1}{3}}$

.....

(1)

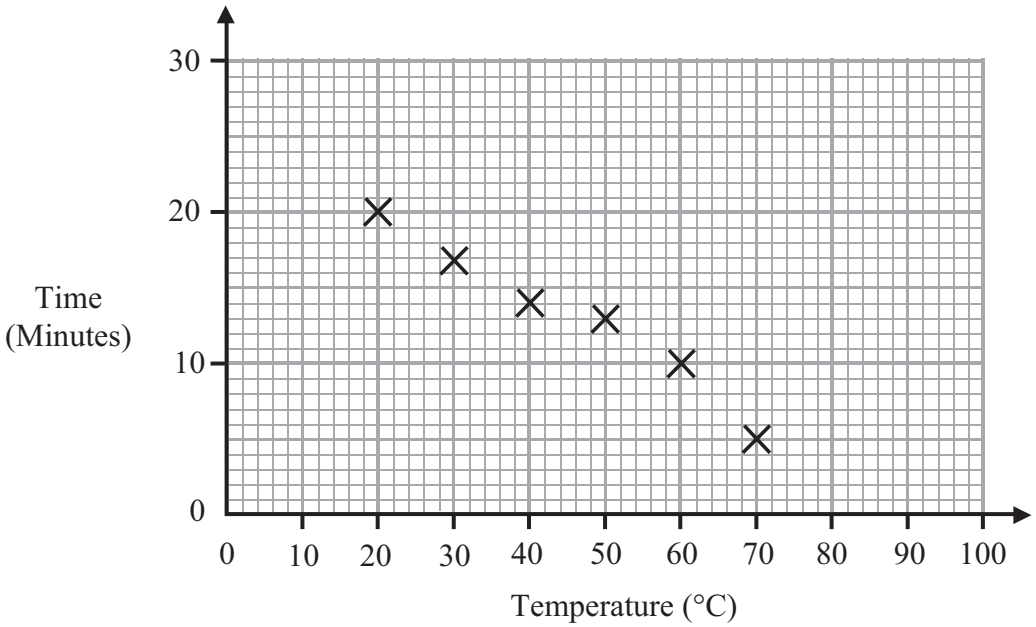
(b) Find the value of $25^{-\frac{1}{2}}$

.....

(2)

(Total for Question 15 is 3 marks)

11. Suzy did an experiment to study the times, in minutes, it took 1 cm ice cubes to melt at different temperatures.
Some information about her results is given in the scatter graph.



The table shows information from two more experiments.

Temperature (°C)	15	55
Time (Minutes)	22	15

(a) On the scatter graph, plot the information from the table.

(1)

(b) Describe the relationship between the temperature and the time it takes a 1 cm ice cube to melt.

.....

(1)

(c) Find an estimate for the time it takes a 1 cm ice cube to melt when the temperature is 25 °C.

..... minutes

(2)

Suzy's data cannot be used to predict how long it will take a 1 cm ice cube to melt when the temperature is 100 °C.

(d) Explain why.

.....

(1)

Q11

(Total 5 marks)

18. (a) Write down the value of 2^0

.....

(1)

$2^y = \frac{1}{4}$

(b) Write down the value of y.

$y =$ .....

(1)

(c) Work out the value of $9^{-\frac{3}{2}}$

.....

(2)

(Total 4 marks)

Q18

1. (a) Use your calculator to work out

$$\frac{\sqrt{21.5}}{5.8-2.36}$$

Write down all the figures on your calculator display.

.....

(2)

(b) Write down your answer to part (a) correct to 2 decimal places.

.....

(1)

Q1

(Total 3 marks)

10. The temperature (T°C) at noon at a seaside resort was recorded for a period of 60 days. The table shows some of this information.

Temperature (T°C)	Number of days
$10 < T \leqslant 14$	2
$14 < T \leqslant 18$	8
$18 < T \leqslant 22$	14
$22 < T \leqslant 26$	23
$26 < T \leqslant 30$	9
$30 < T \leqslant 34$	4

Calculate an estimate for the mean temperature at noon during these 60 days.
Give your answer correct to 3 significant figures.

.....°C

(Total 4 marks)

Q10

Question 37

18. Change 9 cm^2 to mm^2.

..... mm^2 **Q18**

(Total 2 marks)

Question 38

1 Work out $\frac{1}{5} + \frac{3}{7}$

.....

(Total for Question 1 is 2 marks)

1 Marta asked some students how many cans of drink they each drank yesterday.

The table shows her results.

Number of cans	Frequency
0	6
1	9
2	7
3	3
4	2
5	1

Work out the total number of cans these students drank yesterday.

.....

(Total for Question 1 is 2 marks)

2 The diagram shows a patio in the shape of a rectangle.

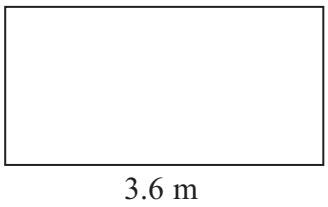


Diagram **NOT** accurately drawn

The patio is 3.6 m long and 3 m wide.

Matthew is going to cover the patio with paving slabs.
Each paving slab is a square of side 60 cm.

Matthew buys 32 of the paving slabs.

(a) Does Matthew buy enough paving slabs to cover the patio?
You must show all your working.

.....

(3)

The paving slabs cost £8.63 each.

(b) Work out the total cost of the 32 paving slabs.

£ .....

(3)

(Total for Question 2 is 6 marks)

Question 41

7 Buses to Acton leave a bus station every 24 minutes.
Buses to Barton leave the same bus station every 20 minutes.

A bus to Acton and a bus to Barton both leave the bus station at 9 00 am.

When will a bus to Acton and a bus to Barton next leave the bus station at the same time?

.....

(Total for Question 7 is 3 marks)

Question 42

4 Work out $\frac{2}{5} + \frac{3}{8}$

Give your answer in its simplest form.

.....

(Total for Question 4 is 2 marks)

7 Here is part of Jo's electricity bill.

Electricity Bill

May 2012

J. Evans
3 Hillside Ave
London



CP Energy
Connecting people
Connecting places

2012

Reading 1st Jan	02792 units
Reading 1st April	03307 units
Number of units used	515 units

Cost: 35p per unit

Work out how much Jo has to pay for the units she has used.

£ .....

(Total for Question 7 is 4 marks)

Question 44

3 Work out $3\frac{1}{3} \div 4\frac{3}{4}$

.....

(Total for Question 3 is 2 marks)

***3** Here is part of Gary's electricity bill.

Electricity bill

New reading	7155 units
Old reading	7095 units

Price per unit 15p

Work out how much Gary has to pay for the units of electricity he used.

(Total for Question 3 is 4 marks)

7 Here is a diagram of Jim's garden.

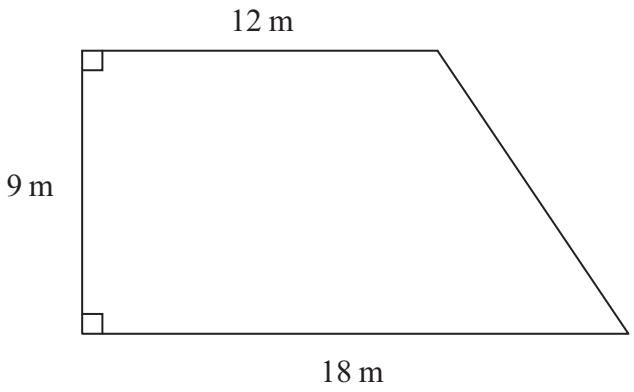


Diagram **NOT** accurately drawn

Jim wants to cover his garden with grass seed to make a lawn.

Grass seed is sold in bags.
There is enough grass seed in each bag to cover 20 m^2 of garden.

Each bag of grass seed costs £4.99

Work out the least cost of putting grass seed on Jim's garden.

£.....

(Total for Question 7 is 4 marks)

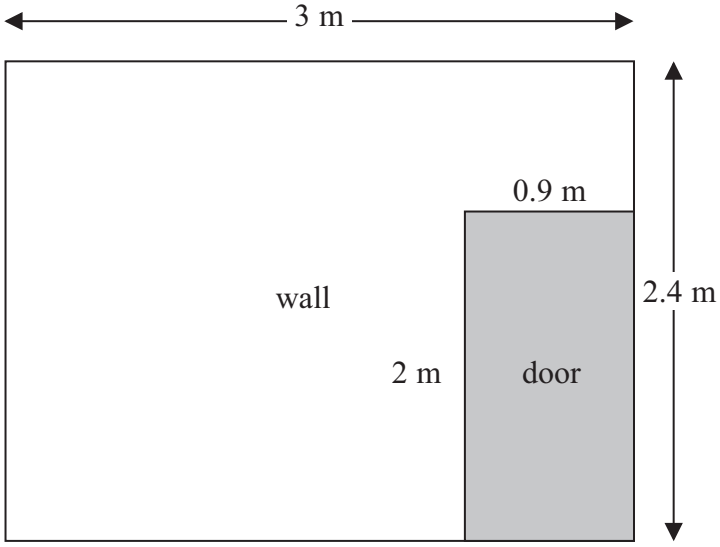
20 Write the following numbers in order of size.
Start with the smallest number.

0.038×10^{2} 3800×10^{-4} 380 0.38×10^{-1}

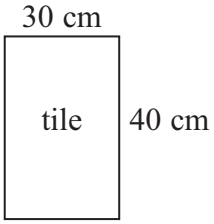
.....

(Total for Question 20 is 2 marks)

6 The diagram shows a wall in Neil's house.



Diagrams **NOT** accurately drawn



Neil is going to cover the wall completely with tiles.
Each tile has a width of 30 cm and a height of 40 cm.

The tiles are sold in packs.
There are 6 tiles in each pack.
Each pack costs £15

Work out the least amount of money Neil needs to pay for the tiles.
You must show all your working.

£ .....

(Total for Question 6 is 4 marks)

7 Using the information that

$$170.2 \div 4.6 = 37$$

write down the value of

(a) $1702 \div 4.6$

.....

(1)

(b) $170.2 \div 460$

.....

(1)

(c) 3.7×4.6

.....

(1)

(Total for Question 7 is 3 marks)

13 Write down the value of

(i) 4^{-2}

.....

(ii) $64^{\frac{1}{3}}$

.....

(Total for Question 13 is 2 marks)

Question 51

1 Work out 1.83×47

.....

(Total for Question 1 is 3 marks)

8 Trams leave Piccadilly

to Eccles every 9 minutes

to Didsbury every 12 minutes

A tram to Eccles and a tram to Didsbury both leave Piccadilly at 9 am.

At what time will a tram to Eccles and a tram to Didsbury next leave Piccadilly at the same time?

.....

(Total for Question 8 is 3 marks)

5

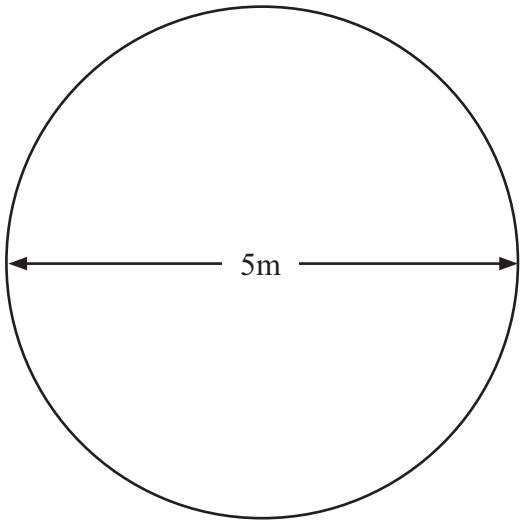


Diagram **NOT** accurately drawn

Jon has a flower garden in the shape of a circle.
The diameter of the garden is 5 metres.

Jon wants to put fencing around the edge of the garden.
The fencing costs £1.80 per metre.

Work out the total cost of the fencing.

£.....

(Total for Question 5 is 3 marks)

2 Grant drives a lorry to deliver some equipment from a factory to a hospital.
The distance from the factory to the hospital is 200 miles.

The lorry uses one litre of fuel to go 5 miles.
A litre of fuel for the lorry costs £1.50

Work out the total cost of the fuel the lorry used.

£.....

(Total for Question 2 is 3 marks)

Question 55

3 Work out $\frac{3}{8} + \frac{1}{3}$

.....

(Total for Question 3 is 2 marks)

12 Write these numbers in order of size.
Start with the smallest number.

4.2×10^5 13×10^4 30×10^{-6} -2.5×10^{-4} 0.0052×10^6

.....

(Total for Question 12 is 3 marks)

Question 57

16 Work out the value of $\frac{\sqrt{5}+1}{2} \times \frac{\sqrt{5}-1}{2}$

Give your answer in its simplest form.

.....

(Total for Question 16 is 3 marks)

Question 58

11 Sam has a swimming pool.

There are 60 000 litres of water in the swimming pool.

Sam wants to put chlorine powder in the water.

She needs 0.75 mg of chlorine powder for each litre of water.

Work out the total amount of chlorine powder Sam needs.
Give your answer in grams.

..... g

(Total for Question 11 is 3 marks)

Question 59

1 Given that $1793 \times 185 = 331\,705$

write down the value of

(a) 1.793×185

.....

(b) $331\,705 \div 1.85$

.....

(Total for Question 1 is 2 marks)

Question 60

19 Write these numbers in order of size.
Start with the smallest number.

5^{-1} 0.5 -5 5^{0}

.....

(Total for Question 19 is 2 marks)

Question 61

6 Tame Valley is a company that makes yoghurt.

A machine fills trays of 20 pots with yoghurt.
In one hour, the machine fills a total of 15 000 pots.

Work out how many seconds the machine takes to fill each tray of 20 pots.

..... seconds

(Total for Question 6 is 4 marks)

8 The diagram shows the plan of a playground.

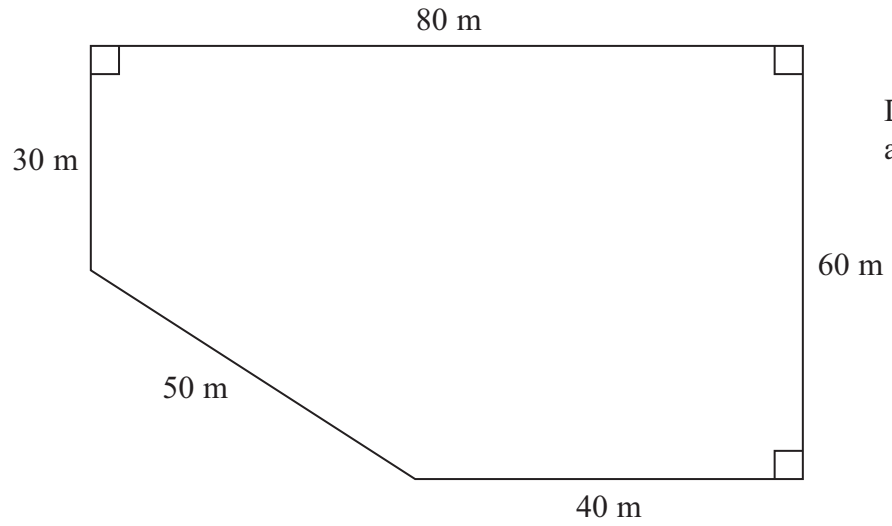


Diagram **NOT** accurately drawn

Bill is going to cover the playground with tarmac.
It costs £2.56 to cover each square metre with tarmac.

Work out the total cost of the tarmac Bill needs.

£.....

(Total for Question 8 is 4 marks)

Question 63

1 The cost of 6 cups is £7.80
Work out the cost of 10 of these cups.

£.....

(Total for Question 1 is 2 marks)

7 Rita is going to make some cheeseburgers for a party.
She buys some packets of cheese slices and some boxes of burgers.

There are 20 cheese slices in each packet.
There are 12 burgers in each box.

Rita buys exactly the same number of cheese slices and burgers.

(i) How many packets of cheese slices and how many boxes of burgers does she buy?

..... packets of cheese slices

..... boxes of burgers

Rita wants to put one cheese slice and one burger into each bread roll.
She wants to use all the cheese slices and all the burgers.

(ii) How many bread rolls does Rita need?

..... bread rolls

(Total for Question 7 is 4 marks)

14 (a) Write down the reciprocal of 5

.....

(1)

(b) Evaluate 3^{-2}

.....

(1)

(c) Calculate $9 \times 10^4 \times 3 \times 10^3$
Give your answer in standard form.

.....

(2)

(Total for Question 14 is 4 marks)

14 The table gives information about the temperature, T °C, at noon in a town for 50 days.

Temperature (T °C)	Frequency
$8 < T \leqslant 12$	6
$12 < T \leqslant 16$	8
$16 < T \leqslant 20$	13
$20 < T \leqslant 24$	21
$24 < T \leqslant 28$	2

(a) Write down the modal class interval.

.....

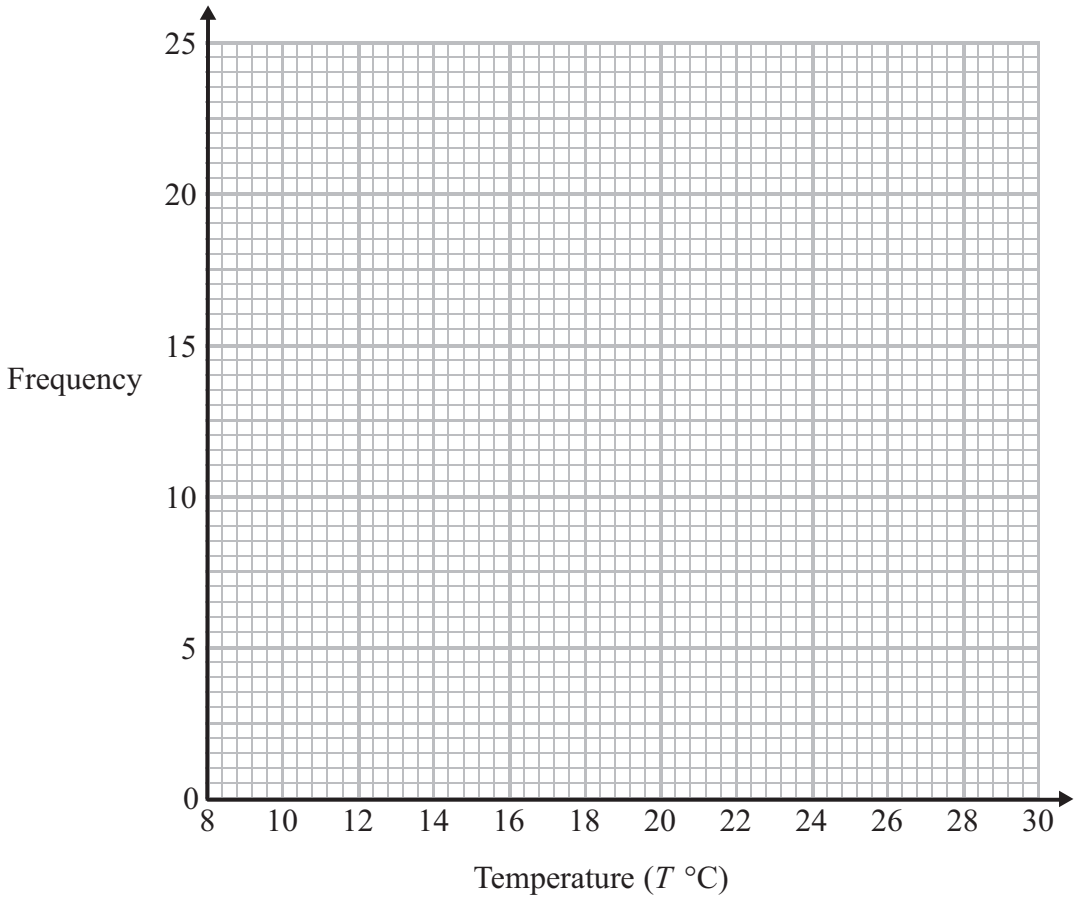
(1)

(b) Calculate an estimate for the mean temperature.

..... °C

(4)

(c) Draw a frequency polygon for the information in the table.



(2)

(Total for Question 14 is 7 marks)

15 (a) (i) Use your calculator to work out $\dfrac{\sqrt{46.2 - 17.5}}{2.39 \times 0.7}$

Write down all the figures on your calculator display.

.....

(ii) Give your answer to (i) correct to 3 significant figures.

.....

(3)

(b) Work out $(2.34 \times 10^5) \times (5 \times 10^4)$
Give your answer in standard form.

.....

(2)

(Total for Question 15 is 5 marks)

15 (a) (i) Use your calculator to work out $\dfrac{\sqrt{46.2 - 17.5}}{2.39 \times 0.7}$

Write down all the figures on your calculator display.

.....

(ii) Give your answer to (i) correct to 3 significant figures.

.....

(3)

(b) Work out $(2.34 \times 10^5) \times (5 \times 10^4)$
Give your answer in standard form.

.....

(2)

(Total for Question 15 is 5 marks)

Question 69

1 (a) Work out $\frac{1}{7} \times \frac{2}{3}$

.....

(1)

(b) Work out $\frac{3}{5} - \frac{1}{3}$

.....

(2)

(Total for Question 1 is 3 marks)

12 You can change temperatures from °F to °C by using the formula

$$C = \frac{5(F - 32)}{9}$$

F is the temperature in °F.
C is the temperature in °C.

The minimum temperature in an elderly person's home should be 20 °C.

Mrs Smith is an elderly person.
The temperature in Mrs Smith's home is 77 °F.

*(a) Decide whether or not the temperature in Mrs Smith's home is lower than the minimum temperature should be.

(3)

(b) Make F the subject of the formula $C = \frac{5(F - 32)}{9}$

.....

(3)

(Total for Question 12 is 6 marks)

***13**

Competition

a prize every 2014 seconds

In a competition, a prize is won every 2014 seconds.

Work out an estimate for the number of prizes won in 24 hours.
You must show your working.

(Total for Question 13 is 4 marks)

17 (a) Write down the value of 10^0

.....

(1)

(b) Write down the value of 10^{-2}

.....

(1)

(c) Write these numbers in order of size.
Start with the smallest number.

2.73×10^3 27.3×10^{-3} 273×10^2 0.00273

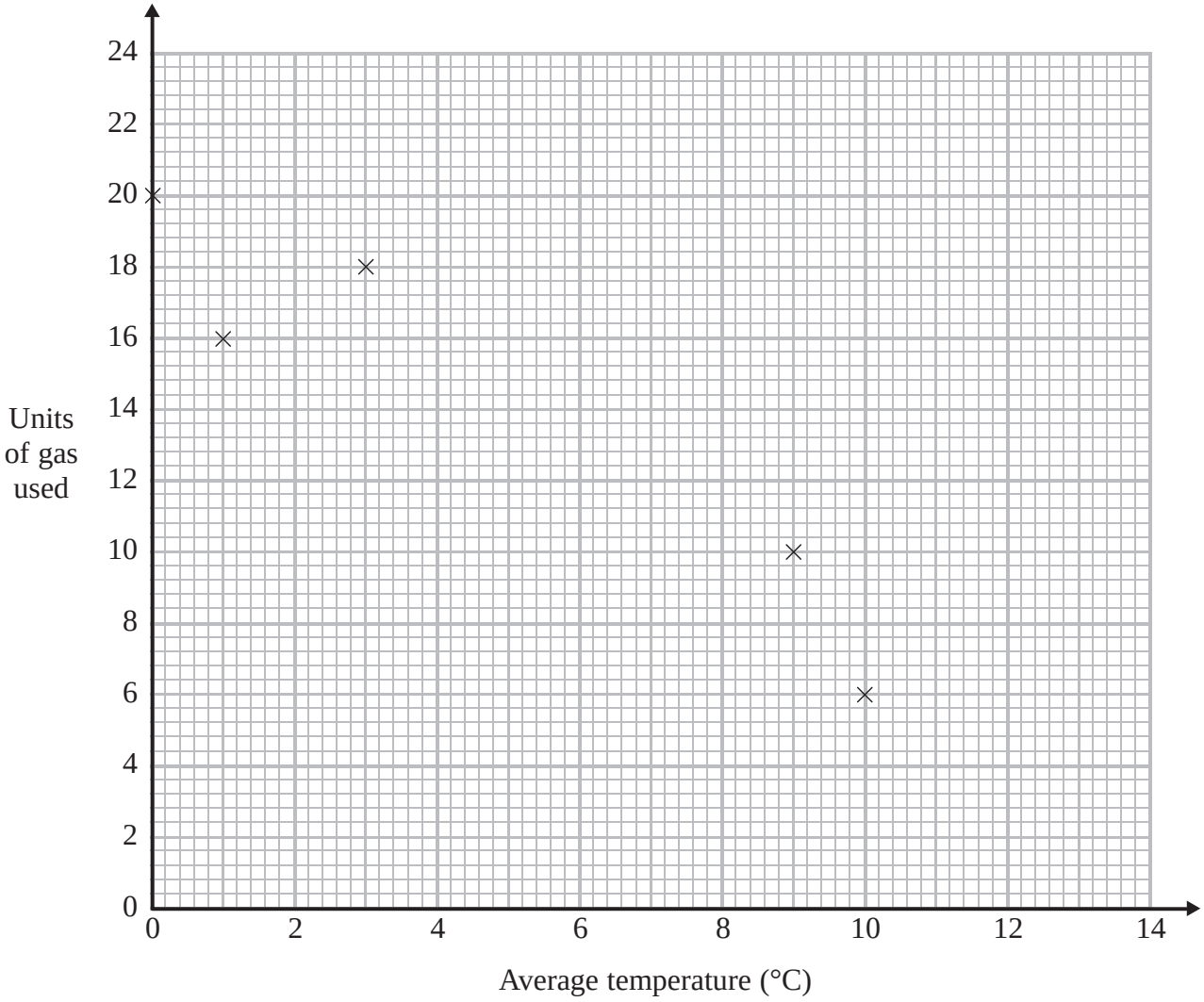
.....

(2)

(Total for Question 17 is 4 marks)

2 The table shows the average temperature on each of seven days and the number of units of gas used to heat a house on these days.

Average temperature (°C)	0	1	3	9	10	12	13
Units of gas used	20	16	18	10	6	6	2



(a) Complete the scatter graph to show the information in the table.
The first 5 points have been plotted for you.

(1)

(b) Describe the relationship between the average temperature and the number of units of gas used.

.....

.....

(1)

(c) Estimate the average temperature on a day when 12 units of gas are used.

..... °C

(2)

(Total for Question 2 is 4 marks)

3 $x = 0.7$

Work out the value of $\dfrac{(x+1)^2}{2x}$

Write down all the figures on your calculator display.

.....

(Total for Question 3 is 2 marks)

14 Ali is planning a party.

He wants to buy some cakes and some sausage rolls.

The cakes are sold in boxes.
There are 12 cakes in each box.
Each box of cakes costs £2.50

The sausage rolls are sold in packs.
There are 8 sausage rolls in each pack.
Each pack of sausage rolls costs £1.20

Ali wants to buy more than 60 cakes and more than 60 sausage rolls.
He wants to buy exactly the same number of cakes as sausage rolls.

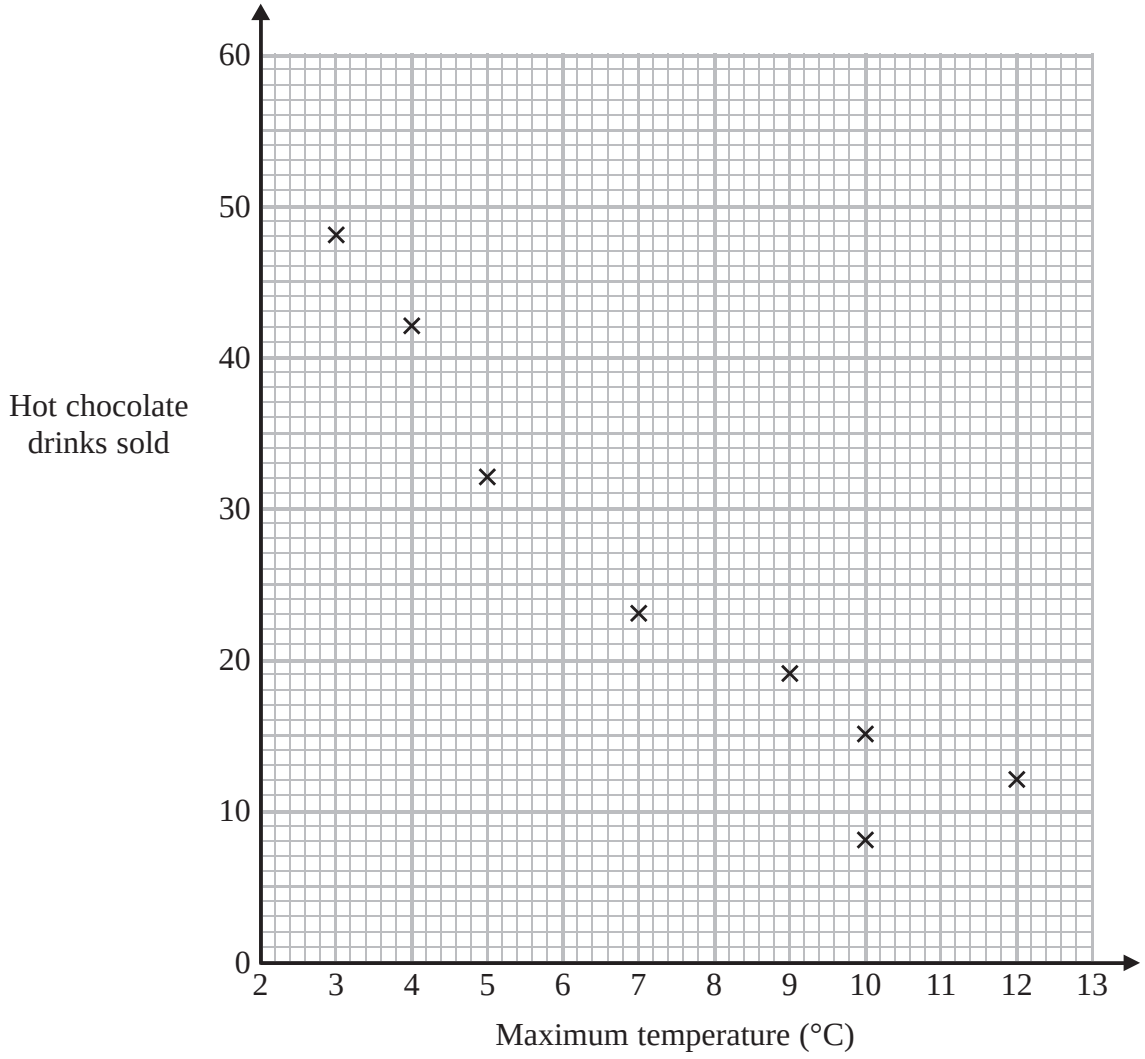
What is the least amount of money Ali will have to pay?

£.....

(Total for Question 14 is 5 marks)

2 Carlos has a cafe in Clacton.
Each day, he records the maximum temperature in degrees Celsius (°C) in Clacton and the number of hot chocolate drinks sold.

The scatter graph shows this information.



On another day the maximum temperature was 6 °C and 35 hot chocolate drinks were sold.

(a) Show this information on the scatter graph.

(1)

(b) Describe the relationship between the maximum temperature and the number of hot chocolate drinks sold.

.....

.....

(1)

(c) Draw a line of best fit on the scatter diagram.

(1)

One day the maximum temperature was 8 °C.

(d) Use your line of best fit to estimate how many hot chocolate drinks were sold.

.....

(1)

(Total for Question 2 is 4 marks)

8 Sally is going to buy some packs of blue paint and some packs of white paint.

Blue paint is sold in packs of 12 tubes.
White paint is sold in packs of 15 tubes.

Sally is going to put all the tubes of paint she buys into boxes.
She is going to put 1 tube of blue paint and 1 tube of white paint in each box.

Sally wants to buy the smallest number of packs of blue paint and the smallest number of packs of white paint.

Work out the number of packs of blue paint and the number of packs of white paint she will buy.

..... packs of blue paint

..... packs of white paint

(Total for Question 8 is 4 marks)

Question 78

11 Write these numbers in order of size.
Start with the smallest number.

0.0034×10^5 34×10^{-5} -3.4×10^{-3} 3.4×10^4 34×10^2

.....

(Total for Question 11 is 3 marks)

1 Using the information that

$$6.7 \times 52 = 348.4$$

find the value of

(i) 6.7×520

.....

(ii) 67×0.52

.....

(iii) $3484 \div 5.2$

.....

(Total for Question 1 is 3 marks)

***6** Steve wants to put a hedge along one side of his garden.

He needs to buy 27 plants for the hedge.
Each plant costs £5.54

Steve has £150 to spend on plants for the hedge.

Does Steve have enough money to buy all the plants he needs?

(Total for Question 6 is 4 marks)

14 Suha has a full 600 m*l* bottle of wallpaper remover.
She is going to mix some of the wallpaper remover with water.

Here is the information on the label of the bottle.

Wallpaper remover
600 m*l*

Mix $\frac{1}{4}$ of the wallpaper remover
with 4500 m*l* of water

Suha is going to use 750 m*l* of water.

How many millilitres of wallpaper remover should Suha use?
You must show your working.

..... m*l*

(Total for Question 14 is 4 marks)

15 A cinema sells adult tickets and child tickets.

The total cost of 3 adult tickets and 1 child ticket is £30
The total cost of 1 adult ticket and 3 child tickets is £22

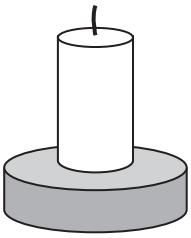
Work out the cost of an adult ticket and the cost of a child ticket.

adult ticket £.....

child ticket £.....

(Total for Question 15 is 4 marks)

5 Caroline is making some table decorations.
Each decoration is made from a candle and a holder.



candle and holder

Caroline buys some candles and some holders each in packs.

There are 30 candles in a pack of candles.
There are 18 holders in a pack of holders.

Caroline buys exactly the same number of candles and holders.

(i) How many packs of candles and how many packs of holders does Caroline buy?

..... packs of candles

..... packs of holders

Caroline uses all her candles and all her holders.

(ii) How many table decorations does Caroline make?

..... table decorations

(Total for Question 5 is 5 marks)

1 (a) Work out the reciprocal of 1.25

.....

(1)

(b) Work out the value of $\frac{9.6}{\sqrt{5} - 1.7}$

Give your answer correct to 2 decimal places.

.....

(2)

(Total for Question 1 is 3 marks)

***19** The Singh family and the Peterson family go to the cinema.

The Singh family buy 2 adult tickets and 3 child tickets.
They pay £28.20 for the tickets.

The Peterson family buy 3 adult tickets and 5 child tickets.
They pay £44.75 for the tickets.

Find the cost of each adult ticket and each child ticket.

(Total for Question 19 is 5 marks)

9 John buys some boxes of pencils and some packets of pens for people to use at a conference.

There are 40 pencils in a box.
There are 15 pens in a packet.

John gives one pencil and one pen to each person at the conference.
He has no pencils left.
He has no pens left.

How many boxes of pencils and how many packets of pens did John buy?

..... boxes of pencils

..... packets of pens

(Total for Question 9 is 3 marks)

Question 87

***5** Redlands School sent x students to a revision day.
St Samuel's School sent twice as many students as Redlands School.
Francis Long School sent 7 fewer students than Redlands School.

Each student paid £15 for the revision day.
The students paid a total of £1155

Work out how many students were sent by each school to the revision day.
You must show all your working.

(Total for Question 5 is 5 marks)

3 The diagram shows a rectangular floor.

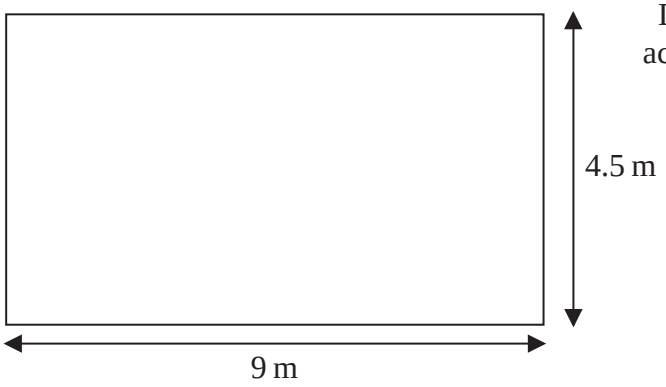


Diagram **NOT** accurately drawn

Toji is going to cover the floor with floor boards.
Each floor board is 0.1 m wide and 1.5 m long.

Work out the smallest number of floor boards Toji needs.

.....

(Total for Question 3 is 3 marks)

Question 89

11 Write these numbers in order of size.
Start with the smallest number.

2.5×10^{2} 0.0025 2.5×10^{-2} 2500

.....

(Total for Question 11 is 2 marks)

14 (a) Write down the value of 6^0

.....

(1)

(b) Work out $64^{-\frac{2}{3}}$

.....

(2)

(Total for Question 14 is 3 marks)

Question 91

1 7 calculators cost £41.65

Work out the cost of 12 of these calculators.

£.....

(Total for Question 1 is 2 marks)

2 Use the fact that

$$5.4 \times 36 = 194.4$$

to find the value of

(i) 5.4×3.6

.....

(ii) 54×360

.....

(Total for Question 2 is 2 marks)

3 Ali is y years old.
Bhavara is twice as old as Ali.
Ceris is 3 years younger than Ali.

The total of their ages is 125 years.

Work out the age of each person.

Ali.....years

Bhavara.....years

Ceris.....years

(Total for Question 3 is 4 marks)

5 Andy is going to cover a wall with tiles.

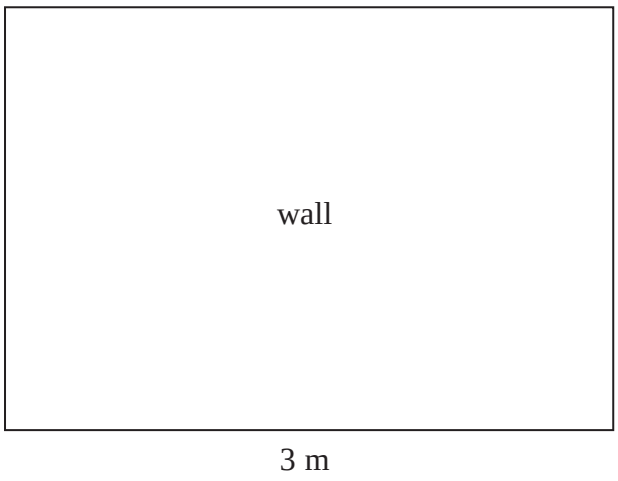
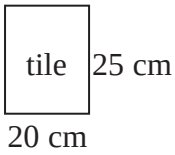


Diagram **NOT** accurately drawn



The wall is in the shape of a rectangle.
The wall is 3 m wide and 2.5 m high.
The tiles are rectangles 20 cm wide and 25 cm high.

The tiles are sold in boxes.
There are 20 tiles in each box.
Each box of tiles costs £8.50

Work out the total cost of the boxes of tiles Andy needs to buy.
You must show all your working.

£ .....

(Total for Question 5 is 5 marks)

Question 95

7 Tom and Amy set the alarms on their phones to sound at 6.45 am.

Both alarms sound together at 6.45 am.
Tom's alarm then sounds every 9 minutes.
Amy's alarm then sounds every 12 minutes.

At what time will both alarms next sound together?

.....

(Total for Question 7 is 3 marks)

11 (a) Write 0.0078 in standard form.

.....

(1)

(b) Write 6.71×10^6 as an ordinary number.

.....

(1)

(c) Write these numbers in order of size.

Start with the smallest number.

$9^{\frac{1}{2}}$ 0.9 -9 9^0

.....

(2)

(Total for Question 11 is 4 marks)

Question 97

5 Harry has a cable.
The cable has a length of 16 metres.

Harry cuts the cable into two parts, part *A* and part *B*.

The length of part *A* is 5 metres.
The weight of part *A* is 8 kg.

Work out the weight of part *B*.

.....kg

(Total for Question 5 is 3 marks)

10 Hilary, Imogen and Jeeha are playing a game with cards.

Imogen has 3 cards more than Hilary.
Jeeha has twice as many cards as Imogen.

They have a total of 53 cards.

Work out how many cards Hilary has.

.....

(Total for Question 10 is 4 marks)

Question 99

5 There are 892 litres of oil in Mr Aston's oil tank.
He uses 18.7 litres of oil each day.

Estimate the number of days it will take him to use all the oil in the tank.

.....

(Total for Question 5 is 2 marks)

*7 The diagram shows the plan of a floor.

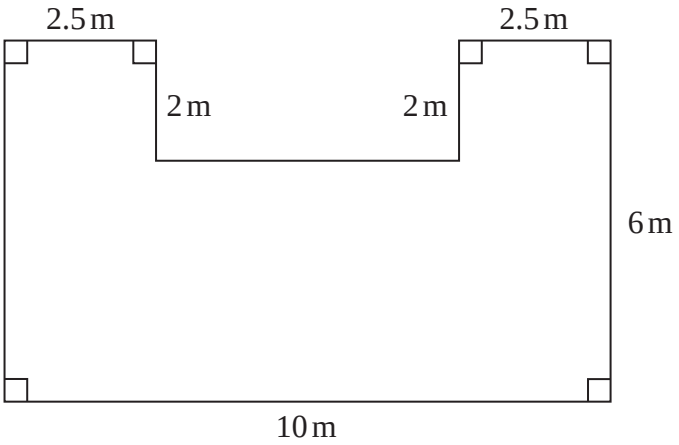


Diagram **NOT** accurately drawn

Angie is going to varnish the floor.

She needs 1 litre of varnish for 5 m^2 of floor.
There are 2.5 litres of varnish in each tin of varnish.

Angie has 3 tins of varnish.

Does she have enough varnish for all the floor?
You must show all your working.

(Total for Question 7 is 5 marks)

8 Carol spins a spinner 80 times.

The table shows information about her results.

Outcome	Frequency
J	39
K	25
L	16

Dan spins this spinner 300 times.

Work out an estimate for the number of times that Dan will get an L.

.....

(Total for Question 8 is 3 marks)

11 Colin works on 5 days each week.
Each day he drives from his home to work and from work to his home.

Colin pays £3.50 each day to use the car park at work.

The distance from Colin's home to work is 18 miles.
Colin's car uses one gallon of petrol every 45.2 miles.

1 litre of petrol costs 136.9p
1 gallon = 4.546 litres

Work out the total cost for Colin to use his car for work each week.
You must show all your working.

£ .....

(Total for Question 11 is 5 marks)

7 Shelley sells books.

On Saturday she is going to give a free book mark and a free dust cover with each book she sells.
All the books are the same size.

Shelley needs to buy the book marks and the dust covers.

Book marks come in boxes.
Each box contains 24 book marks.

Dust covers come in packs.
Each pack contains 36 dust covers.

Shelley wants to have enough book marks and dust covers for 250 books.
She buys exactly the same number of book marks and dust covers.

Work out the number of boxes of book marks and the number of packs of dust covers she buys.
You must show all your working.

..... boxes of book marks

..... packs of dust covers

(Total for Question 7 is 4 marks)

Question 104

***1** 3 litres of juice are needed to fill 15 identical glasses.

Are 5 litres of juice enough to fill 24 of these glasses?

(Total for Question 1 is 3 marks)

11 Alan is on holiday in Germany.
He is driving to Berlin.

Alan drives past this road sign.



Alan stops at a service station 25 miles after the road sign.

Work out how far Alan has to drive from the service station to get to Berlin.

.....

(Total for Question 11 is 3 marks)

6 Jack is building a wall.

He uses 300 bricks to build part of the wall.
This part of the wall is 5 metres long and 1.5 metres high.

The complete wall will be 8 metres long and 1.5 metres high.

How many more bricks does Jack need to complete the wall?

.....

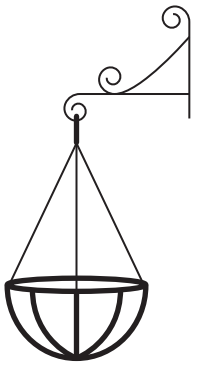
(Total for Question 6 is 3 marks)

***21** Anne wants to fill 12 hanging baskets with compost.

Each hanging basket is a hemisphere of diameter 40 cm.

Anne has 4 bags of compost.
There are 50 litres of compost in each bag.

Has Anne got enough compost to fill the 12 hanging baskets?



hanging basket

(Total for Question 21 is 4 marks)

Question 108

11 Work out $\left(4\frac{3}{5} - 2\frac{2}{3}\right) \div 2\frac{1}{3}$

.....

(Total for Question 11 is 4 marks)

12 (a) Write 2.3×10^{-4} as an ordinary number.

.....

(1)

The populations of 3 cities A, B and C are shown in the table below.

City	Population
A	5.86×10^6
B	4 200 000
C	5.3 million

(b) Write the cities in order of the size of their population.
Show the city with the greatest size of population first.

.....

(2)

(Total for Question 12 is 3 marks)

2 Ben and Lago have some identical packets.

Ben has 20 of the packets.
The total weight of Ben's packets is 32 kg.

Lago has 25 of the packets.

Work out the total weight of Lago's packets.

..... kg

(Total for Question 2 is 2 marks)

***7** There are 1 million gallons of water in a lake.

A company has to pump all the water out of the lake.

The company can use 4 Speedy pumps or 5 Flow pumps.

One Speedy pump can pump 35 gallons out of the lake in 1 minute.
One Flow pump can pump all the water out of the lake in 500 hours.

The company wants to pump all the water out of the lake as quickly as possible.

Should the company use the 4 Speedy pumps or the 5 Flow pumps?
You must show all your working.

(Total for Question 7 is 5 marks)

8 Change 2 m^3 to cm^3.

..... cm^3

(Total for Question 8 is 2 marks)

Question 113

14 3 kg of potatoes and 4 kg of carrots have a total cost of 440p.
4 kg of potatoes and 3 kg of carrots have a total cost of 470p.

Work out the total cost of 1 kg of potatoes and 1 kg of carrots.

.....p

(Total for Question 14 is 4 marks)

10 Gemma has the same number of sweets as Betty.

Gemma gives 24 of her sweets to Betty.
Betty now has 5 times as many sweets as Gemma.

Work out the total number of sweets that Gemma and Betty have.

.....

(Total for Question 10 is 4 marks)

***11** The diagram shows a plan of Brian's lawn.

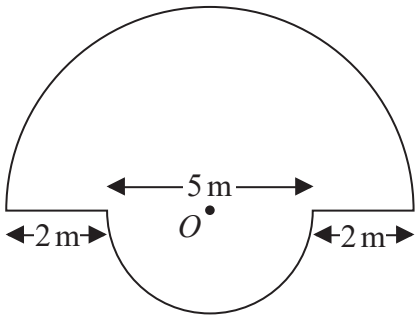


Diagram **NOT** accurately drawn

The edge of the lawn consists of two semicircles and two straight lines.
Each semicircle has centre O.
The diameters of the semicircles are 9 m and 5 m.

Brian is going to put lawn edging around the edge of the lawn.
Lawn edging is sold in 2.4 metre rolls.

Lawn edging

£3.99 per roll
or
3 rolls for £10

Brian has £35

Has Brian got enough money to buy all the rolls of lawn edging he needs?
You must show all your working.

(Total for Question 11 is 5 marks)

***16** The diagram shows a swimming pool in the shape of a prism.

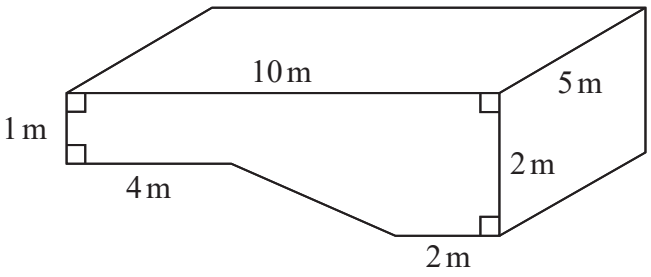


Diagram **NOT** accurately drawn

The swimming pool is empty.

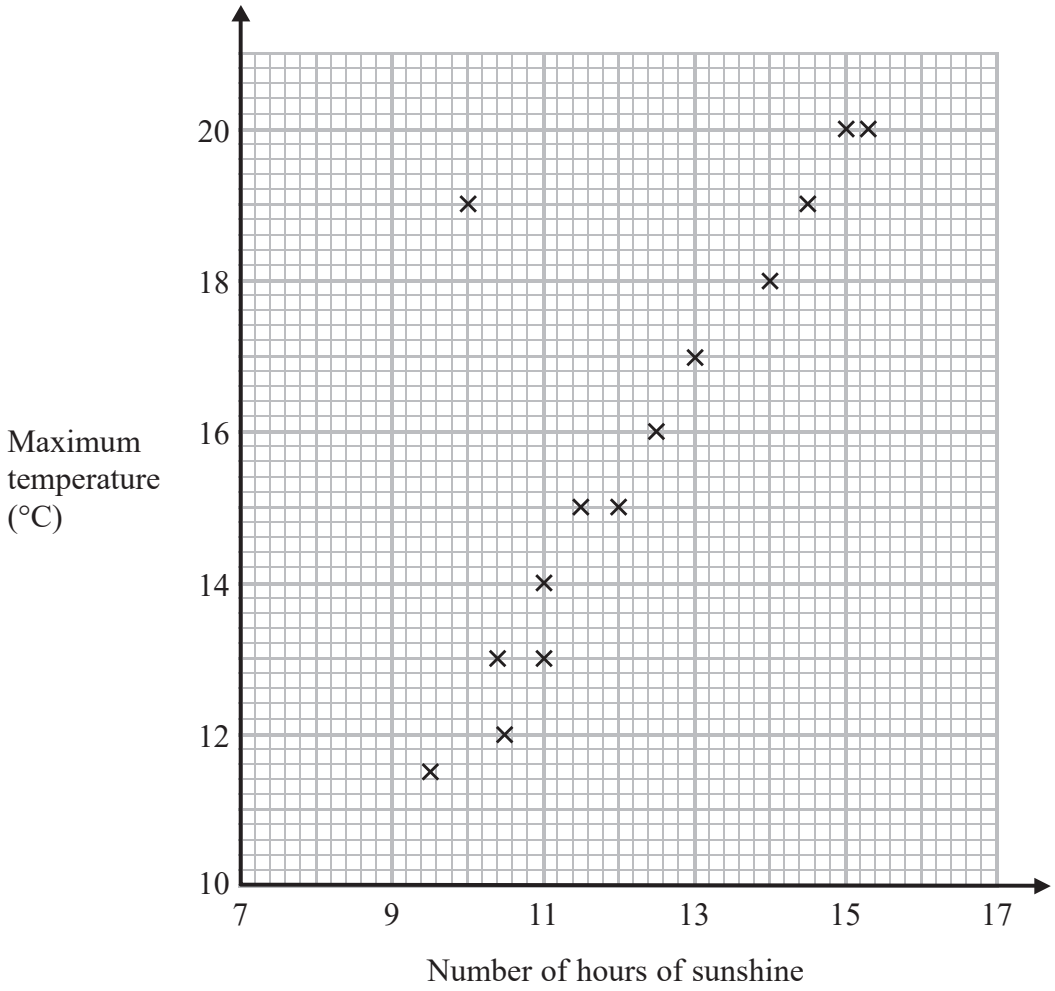
Water from 3 water tankers is going to be put into the pool.
There are 20 000 litres of water in each water tanker.

Sam thinks that the surface of the water in the pool will be 10 cm below the top of the pool.

Is Sam correct?
You must show how you get your answer.
($1\,m^3 = 1000$ litres)

(Total for Question 16 is 5 marks)

1 The scatter graph shows the maximum temperature and the number of hours of sunshine in fourteen British towns on one day.



One of the points is an outlier.

(a) Write down the coordinates of this point.

(..... , ...)

(1)

(b) For all the other points write down the type of correlation.

.....

(1)

On the same day, in another British town, the maximum temperature was 16.4 °C.

(c) Estimate the number of hours of sunshine in this town on this day.

..... hours
(2)

A weatherman says,

"Temperatures are higher on days when there is more sunshine."

(d) Does the scatter graph support what the weatherman says?
Give a reason for your answer.

.....

.....

(1)

(Total for Question 1 is 5 marks)

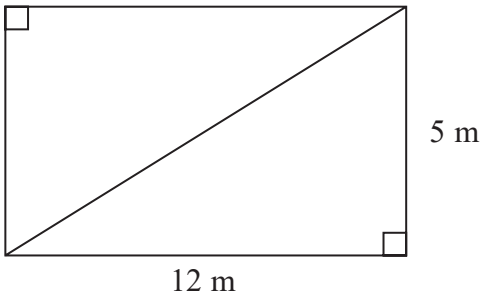
Question 118

3 Work out 54.6×4.3

.....

(Total for Question 3 is 3 marks)

5 This rectangular frame is made from 5 straight pieces of metal.



The weight of the metal is 1.5 kg per metre.

Work out the total weight of the metal in the frame.

..... kg

(Total for Question 5 is 5 marks)

Question 120

June 2017 | 1MA1/3H | Original Q12

12 The points A, B, C and D lie in order on a straight line.

$$AB : BD = 1 : 5$$
$$AC : CD = 7 : 11$$

Work out $AB : BC : CD$

..... : ..... : .....

(Total for Question 12 is 3 marks)

Question 121

November 2017 | 1MA1/1H | Original Q8

8 Write these numbers in order of size.
Start with the smallest number.

$0.2\dot{4}\dot{6}$ $0.24\dot{6}$ $0.\dot{2}4\dot{6}$ 0.246

.....

(Total for Question 8 is 2 marks)

Question 122

November 2017 | 1MA1/1H | Original Q10

10 (a) Write down the value of $100^{\frac{1}{2}}$

.....

(1)

(b) Find the value of $125^{\frac{2}{3}}$

.....

(2)

(Total for Question 10 is 3 marks)

Question 123

11 3 teas and 2 coffees have a total cost of £7.80
5 teas and 4 coffees have a total cost of £14.20

Work out the cost of one tea and the cost of one coffee.

tea £.....

coffee £.....

(Total for Question 11 is 4 marks)

Question 124

9 Yesterday it took 5 cleaners $4\frac{1}{2}$ hours to clean all the rooms in a hotel.

There are only 3 cleaners to clean all the rooms in the hotel today.

Each cleaner is paid £8.20 for each hour or part of an hour they work.

How much will each cleaner be paid today?

£ .....

(Total for Question 9 is 3 marks)

5 (a) Find the value of the reciprocal of 1.6
Give your answer as a decimal.

.....

(1)

Jess rounds a number, x, to one decimal place.
The result is 9.8

(b) Write down the error interval for x.

.....

(2)

(Total for Question 5 is 3 marks)

Question 126

7 Work out $(13.8 \times 10^{7}) \times (5.4 \times 10^{-12})$
Give your answer as an ordinary number.

.....

(Total for Question 7 is 2 marks)

Question 127

June 2018 | 1MA1/1H | Original Q9

9 (a) Write down the value of $36^{\frac{1}{2}}$

.....

(1)

(b) Write down the value of 23^0

.....

(1)

(c) Work out the value of $27^{-\frac{2}{3}}$

.....

(2)

(Total for Question 9 is 4 marks)

Question 128

14 There are 16 hockey teams in a league.
Each team played two matches against each of the other teams.

Work out the total number of matches played.

.....

(Total for Question 14 is 2 marks)

Question 129

1 Work out the value of $\dfrac{3^7 \times 3^{-2}}{3^3}$

.....

(Total for Question 1 is 2 marks)

Question 130

November 2018 | 1MA1/1H | Original Q4

4 It would take 120 minutes to fill a swimming pool using water from 5 taps.

(a) How many minutes will it take to fill the pool if only 3 of the taps are used?

..... minutes

(2)

(b) State one assumption you made in working out your answer to part (a).

.....

.....

(1)

(Total for Question 4 is 3 marks)

Question 131

1 (a) Write 7357 correct to 3 significant figures.

.....

(1)

(b) Work out $\dfrac{\sqrt{17 + 4^2}}{7.3^2}$

Write down all the figures on your calculator display.

.....

(2)

(Total for Question 1 is 3 marks)

Question 132

November 2018 | 1MA1/3H | Original Q13

13 The number of animals in a population at the start of year t is P_t
The number of animals at the start of year 1 is 400

Given that

$$P_{t+1} = 1.01P_t$$

work out the number of animals at the start of year 3

.....

(Total for Question 13 is 2 marks)

2 Deon needs 50 g of sugar to make 15 biscuits.

She also needs
three times as much flour as sugar
two times as much butter as sugar

Deon is going to make 60 biscuits.

(a) Work out the amount of flour she needs.

..... g
(3)

Deon has to buy all the butter she needs to make 60 biscuits.
She buys the butter in 250 g packs.

(b) How many packs of butter does Deon need to buy?

.....
(2)

(Total for Question 2 is 5 marks)

Question 134

June 2019 | 1MA1/3H | Original Q12

12 Patrick has to work out the exact value of $64^{\frac{1}{4}}$

Patrick says,

"$\frac{1}{4}$ of 64 is 16 so $64^{\frac{1}{4}} = 16$"

Explain what is wrong with what Patrick says.

.....

.....

.....

(Total for Question 12 is 1 mark)

Question 135

2 (a) Use your calculator to work out $\dfrac{29^2 - 4.6}{\sqrt{35 - 1.9^3}}$

Write down all the figures on your calculator display.

.....

(2)

(b) Write your answer to part (a) correct to 4 significant figures.

.....

(1)

(Total for Question 2 is 3 marks)

Question 136

9 Write these numbers in order of size.
Start with the smallest number.

6.72×10^5 67.2×10^{-4} 672×10^4 $0.000\,672$

....

(Total for Question 9 is 2 marks)

19 A hot air balloon is descending.
The height of the balloon n minutes after it starts to descend is h_n metres.

The height of the balloon $(n+1)$ minutes after it starts to descend, h_{n+1} metres, is given by

$$h_{n+1} = K \times h_n + 20 \quad \text{where } K \text{ is a constant.}$$

The balloon starts to descend from a height of 1200 metres at 09 15
At 09 16 the height of the balloon is 1040 metres.

Work out the height of the balloon at 09 18

..... m

(Total for Question 19 is 4 marks)

1 (a) Work out 3.67×4.2

.....

(3)

(b) Work out $59.84 \div 1.6$

.....

(3)

(Total for Question 1 is 6 marks)

9 (a) Write down the value of 7^0

.....

(1)

(b) Find the value of $3 \times 3^6 \times 3^{-6}$

.....

(1)

(c) Find the value of 2^{-4}

.....

(1)

(d) Find the value of $27^{\frac{1}{3}}$

.....

(1)

(Total for Question 9 is 4 marks)

2 Natalie makes potato cakes in a restaurant.

She mixes potato, cheese and onion so that

$$\text{weight of potato} : \text{weight of cheese} : \text{weight of onion} = 9 : 2 : 1$$

Natalie needs to make 6000 g of potato cakes.

Cheese costs £2.25 for 175 g.

Work out the cost of the cheese needed to make 6000 g of potato cakes.

£.....

(Total for Question 2 is 4 marks)

9 On Monday, 12 people took 5 hours to clean a number of cars.
On Tuesday, 15 people cleaned the same number of cars.

Assuming that all the people worked at the same rate,

(a) work out how many hours the 15 people took to clean the cars.

..... hours
(2)

The assumption is wrong.

(b) How might this affect the time taken for the 15 people to clean the cars?

.....

.....

.....

(1)

(Total for Question 9 is 3 marks)

18 Work out the value of $\dfrac{\left(5\frac{4}{9}\right)^{-\frac{1}{2}} \times \left(4\frac{2}{3}\right)}{2^{-3}}$

You must show all your working.

.....

(Total for Question 18 is 4 marks)

Question 143

11 Kieron has 13 workers he can use for a job.

He knows that 6 workers would take $14\frac{1}{2}$ days to complete this job.

Show that Kieron has enough workers to finish this job in less than 7 days.

(Total for Question 11 is 3 marks)

Question 144

November 2022 | 1MA1/1H | Original Q4

4 Work out 0.004×0.32

.....

(Total for Question 4 is 2 marks)

Question 145

November 2022 | 1MA1/1H | Original Q17

17 Work out the value of $\left(\frac{8}{27}\right)^{\frac{4}{3}}$

.....

(Total for Question 17 is 2 marks)

Question 146

1 Work out $8.46 \div 0.15$

.....

(Total for Question 1 is 3 marks)

Question 147

June 2023 | 1MA1/1H | Original Q18

18 7 kg of carrots and 5 kg of tomatoes cost a total of 480p

cost of 1 kg of carrots : cost of 1 kg of tomatoes = 5 : 9

Work out the cost of 1 kg of carrots and the cost of 1 kg of tomatoes.

carrots .....p

tomatoes .....p

(Total for Question 18 is 4 marks)

Question 148

1 (a) Work out the value of $\dfrac{25 - \sqrt{43.87}}{6 + 2.1^2}$

Write down all the figures on your calculator display.

.....

(2)

(b) Work out the value of the reciprocal of 0.625

.....

(1)

(Total for Question 1 is 3 marks)

Question 149

4 It takes 14 hours for 5 identical pumps to fill a water tank.

How many hours would it take 4 of these pumps to fill another water tank of the same size?

..... hours

(Total for Question 4 is 2 marks)

Question 150

1 Work out 6.3×2.4

.....

(Total for Question 1 is 3 marks)

Question 151

14 Work out the value of $27^{\frac{2}{3}} + \left(\frac{1}{2}\right)^{-3}$

.....

(Total for Question 14 is 3 marks)

3 Seija works at a weather station.
The table gives information about the temperature, T °C, at midday for each of 50 cities in the UK on Tuesday.

Temperature (T °C)	Frequency
$10 < T \leqslant 15$	2
$15 < T \leqslant 20$	8
$20 < T \leqslant 25$	13
$25 < T \leqslant 30$	21
$30 < T \leqslant 35$	6

(a) Calculate an estimate for the mean temperature.

.....°C
(3)

Seija says,

> "The median temperature is 22.5 °C because 22.5 is the middle number in the middle group."

(b) Is Seija correct?
Give a reason for your answer.

.....

.....

.....

(1)

(Total for Question 3 is 4 marks)

5 Ali buys packs of balloons and boxes of pencils.

There are 30 balloons in each pack.
There are 24 pencils in each box.

Ali buys exactly the same number of balloons and pencils.

Work out how many packs of balloons and how many boxes of pencils she could have bought.
You must show all your working.

..... packs of balloons

..... boxes of pencils

(Total for Question 5 is 3 marks)

Question 154

6 A company orders a large number of plates from a factory.

It would take 30 hours to make all the plates using 4 machines.

How many machines are needed to make all the plates in 6 hours?

.....

(Total for Question 6 is 2 marks)

2 (a) Work out $3\frac{4}{5} - 1\frac{2}{3}$

.....

(2)

Kevin was asked to work out $2\frac{1}{3} \times \frac{5}{8}$

Here is his working and his answer.

$$2\frac{1}{3} \times \frac{5}{8} = \frac{7}{3} \times \frac{5}{8}$$

$$= \frac{35}{24}$$

$$= 1\frac{9}{24}$$

Kevin's answer is wrong.

(b) What mistake has Kevin made?

.....

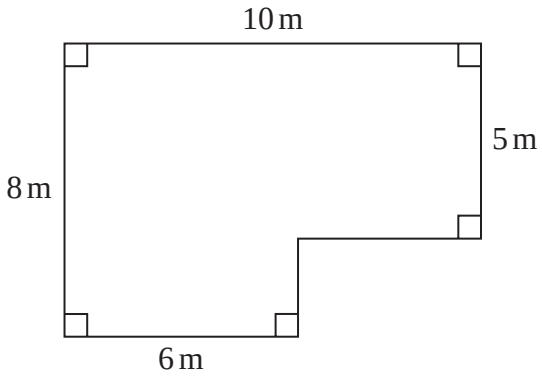
.....

.....

(1)

(Total for Question 2 is 3 marks)

3 The diagram shows a plan of a floor.



Petra is going to cover the floor with paint.

Petra has 3 tins of paint.
There are 2.5 litres of paint in each tin.

Petra thinks 1 litre of paint will cover $10\,m^2$ of floor.

(a) Assuming Petra is correct, does she have enough paint to cover the floor?
You must show all your working.

(4)

Actually, 1 litre of paint will cover $11\,m^2$ of floor.

(b) Does this affect your answer to part (a)?
You must give a reason for your answer.

.....

.....

.....

(1)

(Total for Question 3 is 5 marks)

3 The number of hours, H, that some machines take to make 5000 bottles is given by

$$H = \frac{72}{n}$$ where n is the number of machines.

On Monday, 6 machines made 5000 bottles.
On Tuesday, 9 machines made 5000 bottles.

The machines took more time to make the bottles on Monday than on Tuesday.

How much more time?

..... hours

(Total for Question 3 is 2 marks)

Question 158

1 Work out $818.4 \div 1.2$

.....

(Total for Question 1 is 3 marks)

Question 159

10 (a) Work out $25^{\frac{1}{2}} \times 8^{\frac{1}{3}}$

.....

(2)

(b) Find the value of $\left(\frac{1}{32}\right)^{\frac{3}{5}}$

.....

(2)

(Total for Question 10 is 4 marks)

Question 160

1 Use your calculator to work out the value of

$$\sqrt{\frac{208.3 - 15.7}{5.694 + 1.8^2}}$$

Write down all the digits on your calculator display.

.....

(Total for Question 1 is 2 marks)

Question 161

14 There are 10 football teams in a league.
Each team plays every other team 4 times.

Work out the total number of games played.

.....

(Total for Question 14 is 2 marks)

Question 162

5 This year the total weight of potatoes grown on a farm is $\frac{1}{5}$ less than last year.

This year the total weight of potatoes grown is 8000 tonnes.

Work out the total weight of potatoes grown last year.

..... tonnes

(Total for Question 5 is 3 marks)