

Write your name here

Surname

Other names

Pearson Edexcel

Centre Number

Candidate Number

Level 1/Level 2 GCSE (9–1)

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Mathematics

Paper 1 (Non-Calculator)

Foundation Tier

Thursday 24 May 2018 – Morning

Time: 1 hour 30 minutes

Paper Reference

1MA1/1F

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.
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 not be used.**

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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.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 6324 correct to the nearest thousand.

The 6 is in the thousands place. The 3 in the next place causes the 6 to stay the same and all other digits become 0 (rounding down to 6000)

6000

(Total for Question 1 is 1 mark)

- 2 (a) Write the following numbers in order of size.
Start with the smallest number.

-6 6 -5 0 12

The more negative or less positive a number, the smaller the number is. Negative numbers are smaller than positive numbers

-6, -5, 0, 6, 12

(1)

- (b) Write the following numbers in order of size.
Start with the smallest number.

0.078 0.78 0.87 0.708

All the units are 0 so compare the tenths then hundredths

0.078, 0.708, 0.78, 0.87

(1)

(Total for Question 2 is 2 marks)

- 3 Write 20% as a fraction.

Percent means out of 100

$\frac{20}{100}$

(Total for Question 3 is 1 mark)

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4 Here is a list of four fractions.

$\frac{4}{16}$

$\frac{2}{8}$

$\frac{15}{60}$

$\frac{3}{9}$

We can't divide 9 to get 4

One of these fractions is **not** equivalent to $\frac{1}{4}$

Write down this fraction.

To simplify the fractions, divide the numerator and denominator by the same number. They all simplify to $\frac{1}{4}$ apart from $\frac{3}{9}$, which simplifies to $\frac{1}{3}$

$\frac{3}{9}$

(Total for Question 4 is 1 mark)

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5 Write down the first even multiple of 7

We can count in 7s to list the multiples of 7.
7, 14

14

(Total for Question 5 is 1 mark)

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6 (a) Simplify $3 \times 4t$

$12t$

(1)

(b) Simplify $8a - 3a + 2a$

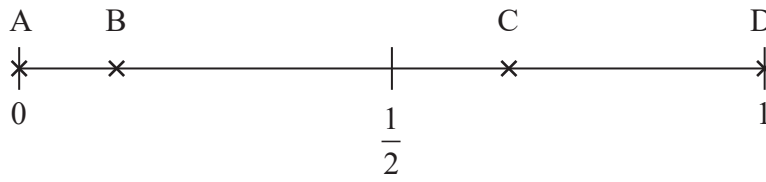
$8a - 3a = 5a$
 $5a + 2a = 7a$

$7a$

(1)

(Total for Question 6 is 2 marks)

- 7 Here is a probability scale.
It shows the probability of each of the events A, B, C and D.



- (a) Write down the letter of the event that is certain.

D

(1)

- (b) Write down the letter of the event that is unlikely.

B

(1)

There are 12 counters in a bag.

- 3 of the counters are red.
- 1 of the counters is blue.
- 2 of the counters are yellow.
- The rest of the counters are green.

Caitlin takes at random a counter from the bag.

- (c) Show that the probability that this counter is yellow or green is $\frac{2}{3}$

$$12 - 3 - 1 - 2 = 6$$

So there are 6 green counters

$$6 + 2 = 8$$

So there are 8 green and yellow counters

$$\frac{8 \div 4}{12 \div 4} = \frac{2}{3}$$

8 out of the 12 counters are green or yellow

(3)

(Total for Question 7 is 5 marks)

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- 8 3 kg of meat costs £54
Nina buys 2 kg of the meat.

Work out how much Nina pays.

$$3 \overline{) 54} \begin{array}{r} 18 \\ \underline{54} \\ 0 \end{array}$$

← Dividing the £54 by 3 works out the cost of 1kg

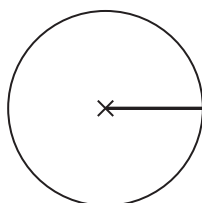
$$\begin{array}{r} 18 \\ \times 2 \\ \hline 36 \end{array}$$

← 2kg is 2 lots of 1kg

£ 36

(Total for Question 8 is 2 marks)

- 9 The centre of this circle is marked with a cross (×).

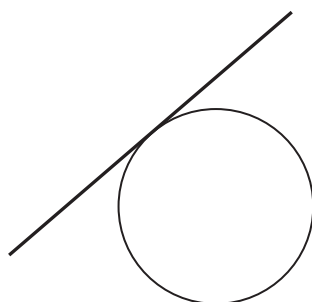


- (a) Write down the mathematical name of the straight line shown in the circle.

..... Radius

(1)

- (b) Write down the mathematical name of the straight line that is touching the circle.



..... Tangent

(1)

(Total for Question 9 is 2 marks)

10 Tim and three friends go on holiday together for a week.

The 4 friends will share the costs of the holiday equally.

Here are the costs of the holiday.

£1280 for 4 return plane tickets

£640 for the villa

£220 for hire of a car for the week

Work out how much Tim has to pay for his share of the costs.

$$\begin{array}{r} 1280 \\ + 640 \\ + 220 \\ \hline 2140 \end{array}$$

Finding the total cost of the holiday

$$4 \overline{) 2140} \begin{array}{r} 535 \\ \underline{20} \\ 14 \\ \underline{12} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

Dividing the total cost by the 4 friends

£ 535

(Total for Question 10 is 3 marks)

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11 Write down an example to show that each of the following two statements is **not** correct.

(a) The factors of an even number are always even.

2 is even and 1 is an odd factor

1 is a factor of 2

(1)

(b) All the digits in odd numbers are odd.

21 is an odd number but the digit 2 is even

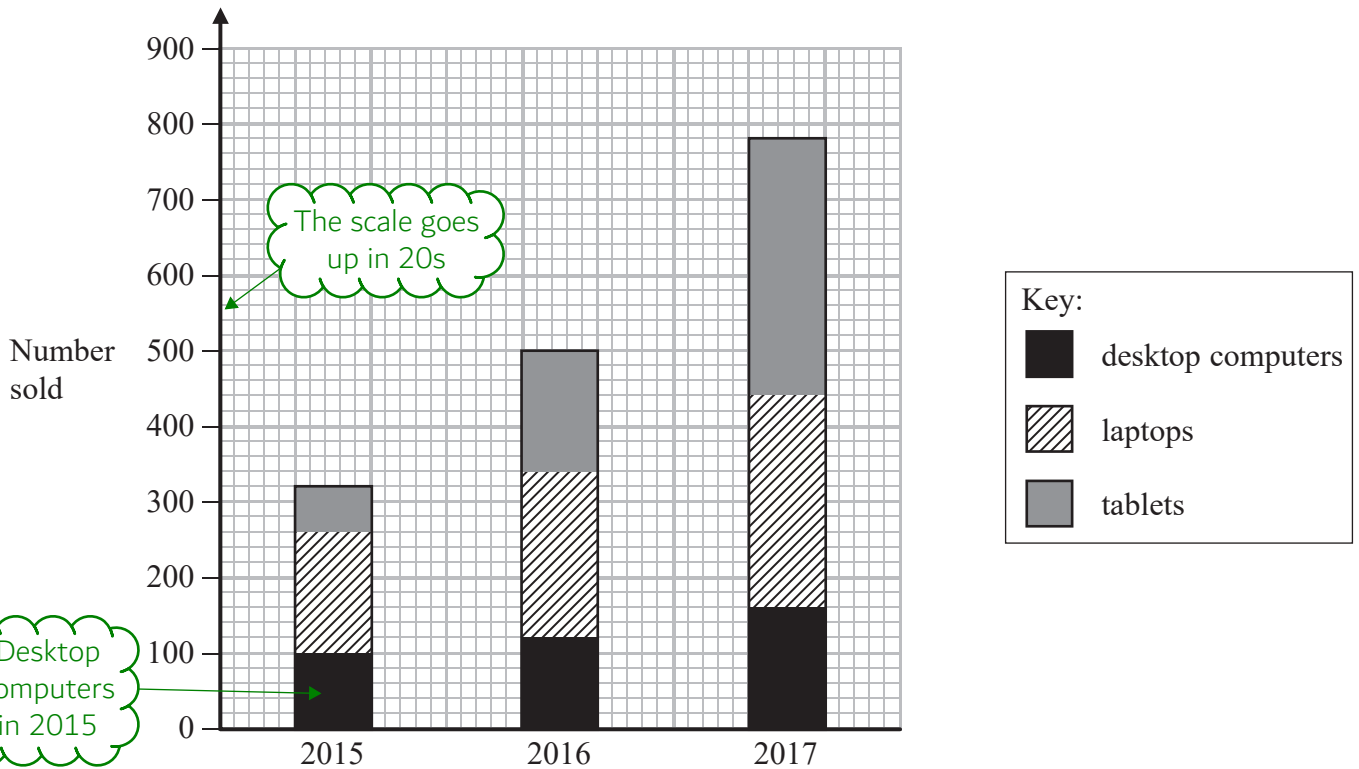
21

(1)

(Total for Question 11 is 2 marks)

12 A shop sells desktop computers, laptops and tablets.

The composite bar chart shows information about sales over the last three years.



(a) Write down the number of desktop computers sold in 2015

100

(1)

(b) Work out the total number of laptops sold in the 3 years.

$$260 - 100 = 160 \leftarrow \text{Laptops in 2015}$$

$$340 - 120 = 220 \leftarrow \text{Laptops in 2016}$$

$$440 - 160 = 280 \leftarrow \text{Laptops in 2017}$$

$$\underline{660} \leftarrow \text{Total laptops sold}$$

660

(3)

(c) State the item that had the greatest increase in sales over the 3 years.

Give a reason for your answer.

Tablets, as they grew by 280. Desktop computers only grew by 60 and laptops only grew by 120

(2)

60 tablets were sold in 2015.
340 were sold in 2017.
 $340 - 60 = 280$

100 desktops were sold in 2015.
160 were sold in 2017.
 $160 - 100 = 60$

160 laptops were sold in 2015.
280 were sold in 2017.
 $280 - 160 = 120$

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Alex says,

“In 2017, more tablets were sold than desktop computers. This means the shop makes more profit from the sale of tablets than from the sale of desktop computers.”

(d) Is Alex correct?

You must justify your answer.

No, because we don't know the profit of each item

For example, there may be no profit on the tablets as the shop may sell them on special offer to attract more customers

(1)

(Total for Question 12 is 7 marks)

13 A piece of wire is 240 cm long.

Peter cuts two 45 cm lengths off the wire.

He then cuts the rest of the wire into as many 40 cm lengths as possible.

Work out how many 40 cm lengths of wire Peter cuts.

$$\begin{array}{r} 45 \\ + 45 \\ \hline 90 \end{array}$$

Working out how much is cut off in total

$$\begin{array}{r} 240 \\ - 90 \\ \hline 150 \end{array}$$

Subtracting what is cut off

$$40 \overline{)150} \quad 3 \text{ r } 30$$

Working out how many lots of 40cm can be got out of 150cm

3

(Total for Question 13 is 3 marks)

14 Gavin, Harry and Isabel each earn the same monthly salary.

Each month,

Gavin **saves** 28% of his salary and spends the rest of his salary 0.28

Harry spends $\frac{3}{4}$ of his salary and **saves** the rest of his salary 0.25

the amount of salary Isabel saves : the amount of salary she spends = 3 : 7 $\frac{3}{10} = 0.3$

Work out who saves the most of their salary each month.

You must show how you get your answer.

Isabel

All the proportions need to be in the same format to compare them. Decimals are good for comparing.

To convert a percentage to a decimal, divide it by 100.
 $28/100 = 0.28$

If $3/4$ is spent, $1/4$ is saved. $1/4$ is 0.25

There are 10 parts in total in the ratio. 3 out of these 10 parts are saved. $3/10$ is 0.3

(Total for Question 14 is 4 marks)

15 Work out 15% of 160 grams.

10% is 16 ← 10% can be found by dividing 160 by 10

5% is 8 ← 5% is half of 10%. $16/2 = 8$

$16+8$ ← Adding together 10% and 5% gives 15%

..... 24 grams

(Total for Question 15 is 2 marks)

16 $P = 4x + 3y$

$x = 5$

$y = -2$

(a) Work out the value of P .

$4(5) + 3(-2)$
 $20 - 6$

Substitute x for 5 and y for -2

14
.....
(2)

(b) Expand $4e(e + 2)$

$4e \times e = 4e^2$
 $4e \times 2 = 8e$

$4e^2 + 8e$
.....
(2)

(c) Solve $3(m - 4) = 21$

$m - 4 = 7$

Divide both sides by 3

Add 4 to both sides

$m = 11$
.....
(2)

(Total for Question 16 is 6 marks)

17 There are some chocolates in a box.

$\frac{1}{4}$ of the chocolates contain nuts.

The rest of the chocolates do not contain nuts.

Write down the ratio of the number of chocolates that contain nuts to the number of chocolates that do not contain nuts.

Give your answer in the form $1 : n$

$$\frac{1}{4} : \frac{3}{4}$$

$\frac{1}{4}$ contain nuts so
 $\frac{3}{4}$ do not contain nuts

Multiply both sides of the ratio
by 4 to eliminate the fractions
and get 1 part on the left

$$1 : 3$$

(Total for Question 17 is 2 marks)

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18 $A = \{\text{multiples of 5 between 14 and 26}\}$ 15, 20, 25

Members of set A

$B = \{\text{odd numbers between 14 and 26}\}$ 15, 17, 19, 21, 23, 25

Members of set B

(a) List the members of $A \cup B$

A or B or both

15, 17, 19, 20, 21, 23, 25 (2)

(b) Describe the members of $A \cap B$

A and B

Odd multiples of 5 between 14 and 26 (1)

(Total for Question 18 is 3 marks)

19 (a) Work out $2\frac{1}{7} + 1\frac{1}{4}$

$$\frac{15}{7} + \frac{5}{4}$$

Converting the mixed numbers into improper fractions by multiplying the whole number by the denominator then adding the result to the numerator

$$\frac{60}{28} + \frac{35}{28}$$

Converting the fractions into equivalent fractions with the same denominators

$$\frac{95}{28}$$

(2)

(b) Work out $1\frac{1}{5} \div \frac{3}{4}$

Give your answer as a mixed number in its simplest form.

$$\frac{6}{5} \times \frac{4}{3}$$

Converting the mixed number into an improper fraction by multiplying the whole number by the denominator then adding the result to the numerator.
Changing the sign to multiplication and flipping the second fraction

$$\frac{24}{15} = \frac{8}{5}$$

Multiplying the numerators and denominators to get 24/15.
Simplifying by dividing both the numerator and denominator by 3

$$8 \div 5 = 1 \text{ remainder } 3$$

$$1\frac{3}{5}$$

(2)

(Total for Question 19 is 4 marks)

20 In a village

the number of houses and the number of flats are in the ratio 7 : 4
the number of flats and the number of bungalows are in the ratio 8 : 5

There are 50 bungalows in the village.

How many houses are there in the village?

$$5p = 50$$

5 parts of the ratio 8:5 is for bungalows and there are 50 of these

$$p = 10$$

Divide both sides by 5 to work out what 1 part of the ratio is worth

$$8p = 80$$

Multiply by 8 to work out the worth of the 8 parts. This is the number of flats

$$4q = 80$$

4 parts of the ratio 7:4 is for the flats

$$q = 20$$

Divide both sides by 4 to work out what 1 part of the ratio is worth

$$7q = 140$$

Multiply by 7 to work out the worth of the 7 parts. This is the number of houses

140

(Total for Question 20 is 3 marks)

- 21 Renee buys 5 kg of sweets to sell.
She pays £10 for the sweets.

Renee puts all the sweets into bags.
She puts 250 g of sweets into each bag.
She sells each bag of sweets for 65p.

Renee sells all the bags of sweets.

Work out her percentage profit.

$$250 \overline{) 5000} \begin{array}{r} 20 \\ \end{array}$$

There are 1000g in 1kg so 5kg is 5000g. 20 lots of 250g go into 5000g so she sells 20 bags

$$\begin{array}{r} 0.65 \\ \times 20 \\ \hline 13.00 \end{array}$$

20 lots of £0.65 is £13. This is how much money she gets by selling the sweets

$$13 - 10 = 3$$

Subtracting the costs of £10 works out that her profit is £3

$$\frac{3}{10} \times 100$$

Expressing the profit as a fraction of the costs then multiplying by 100 to convert it to a percentage

..... 30

%

(Total for Question 21 is 4 marks)

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22 A cycle race across America is 3069.25 miles in length.

Juan knows his average speed for his previous races is 15.12 miles per hour. For the next race across America he will cycle for 8 hours per day.

(a) Estimate how many days Juan will take to complete the race.

$$\begin{array}{c} d \\ S | t \end{array}$$

From the formula triangle, time = distance/speed

$$15 \overline{) 3000} \begin{array}{r} 200 \end{array}$$

The distance is roughly 3000 miles and the speed is roughly 15 miles per hour. This calculates that the time needed is about 200 hours

$$8 \overline{) 200} \begin{array}{r} 25 \end{array}$$

Working out how many lots of 8 hours 200 hours is

25

(3)

Juan trains for the race. The average speed he can cycle at increases. It is now 16.27 miles per hour.

(b) How does this affect your answer to part (a)?

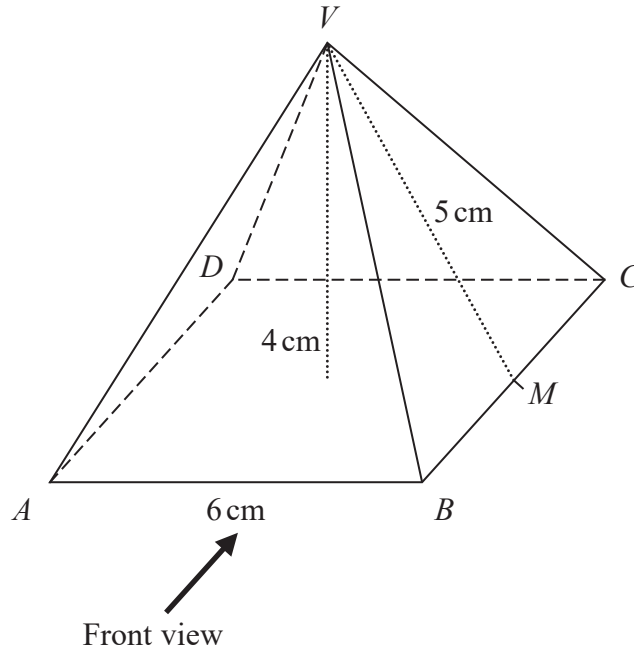
It will take less time

As the speed is higher and time = distance/speed, dividing by more will decrease the time

(1)

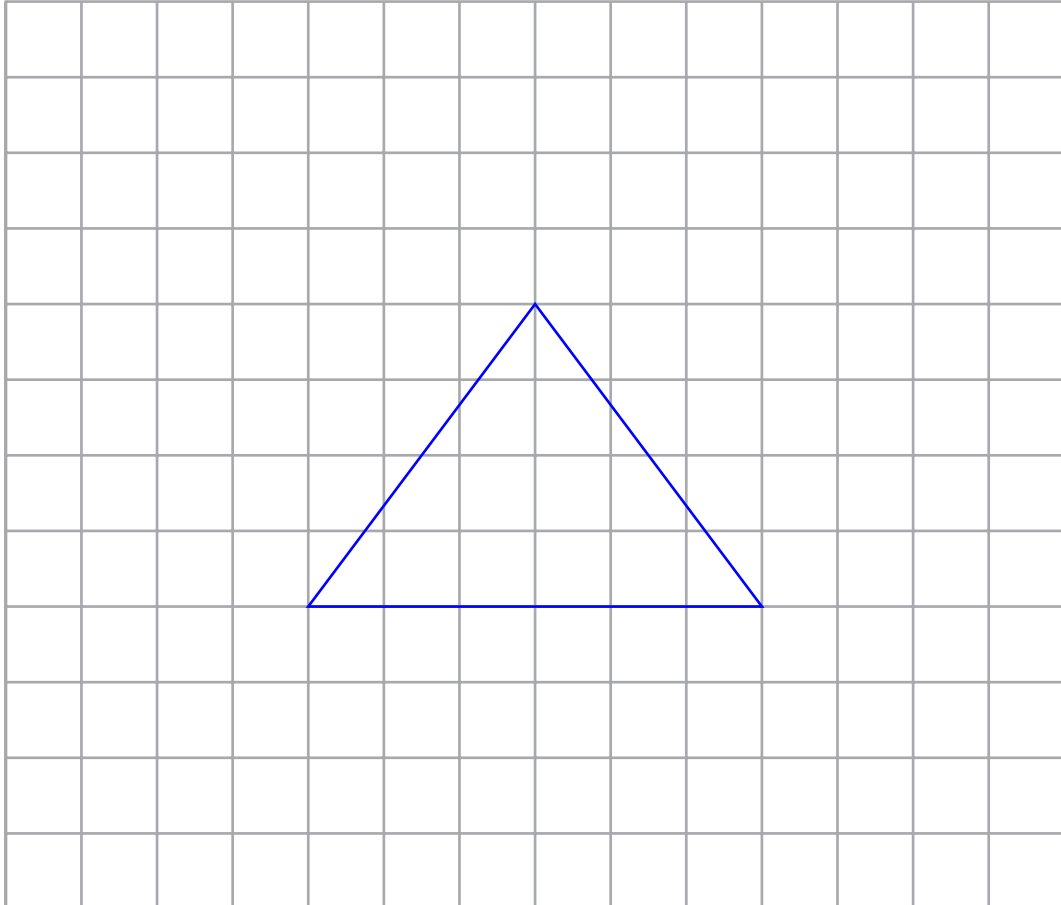
(Total for Question 22 is 4 marks)

23 Here is a solid square-based pyramid, $VABCD$.



The base of the pyramid is a square of side 6 cm.
 The height of the pyramid is 4 cm.
 M is the midpoint of BC and $VM = 5$ cm.

(a) Draw an accurate front elevation of the pyramid from the direction of the arrow.



(2)

(b) Work out the total surface area of the pyramid.

$$6^2 + 4\left(\frac{1}{2} \times 6 \times 5\right)$$

Area of the square is length squared

Area of the four triangles.
 $\frac{1}{2} \times \text{base} \times \text{height} = \text{area of a triangle}$

$$36 + 60$$

$6 \times 6 = 36$
 $\frac{1}{2} \times 6 = 3$
 $3 \times 5 = 15$
 $15 \times 4 = 60$

$$96\text{cm}^2$$

(4)

(Total for Question 23 is 6 marks)

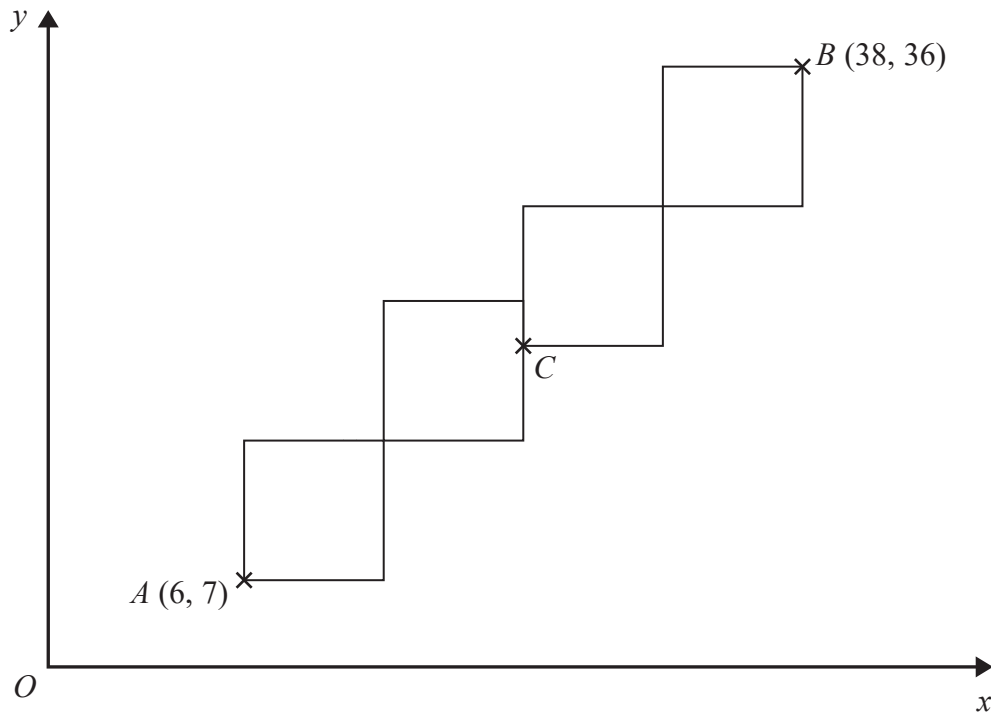
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24 A pattern is made from four identical squares.

The sides of the squares are parallel to the axes.



Point A has coordinates $(6, 7)$

Point B has coordinates $(38, 36)$

Point C is marked on the diagram.

Work out the coordinates of C .

$$38 - 6 = 32$$

The difference in the x coordinates of points A and B gives the distance between them in the x direction

$$32 \div 4 = 8$$

4 squares are the same length as 32. So dividing by 4 works out the length of one of the squares

$$38 - 8 \times 2 = 22$$

C is two squares to the left of B

$$36 - 8 \times 2 = 20$$

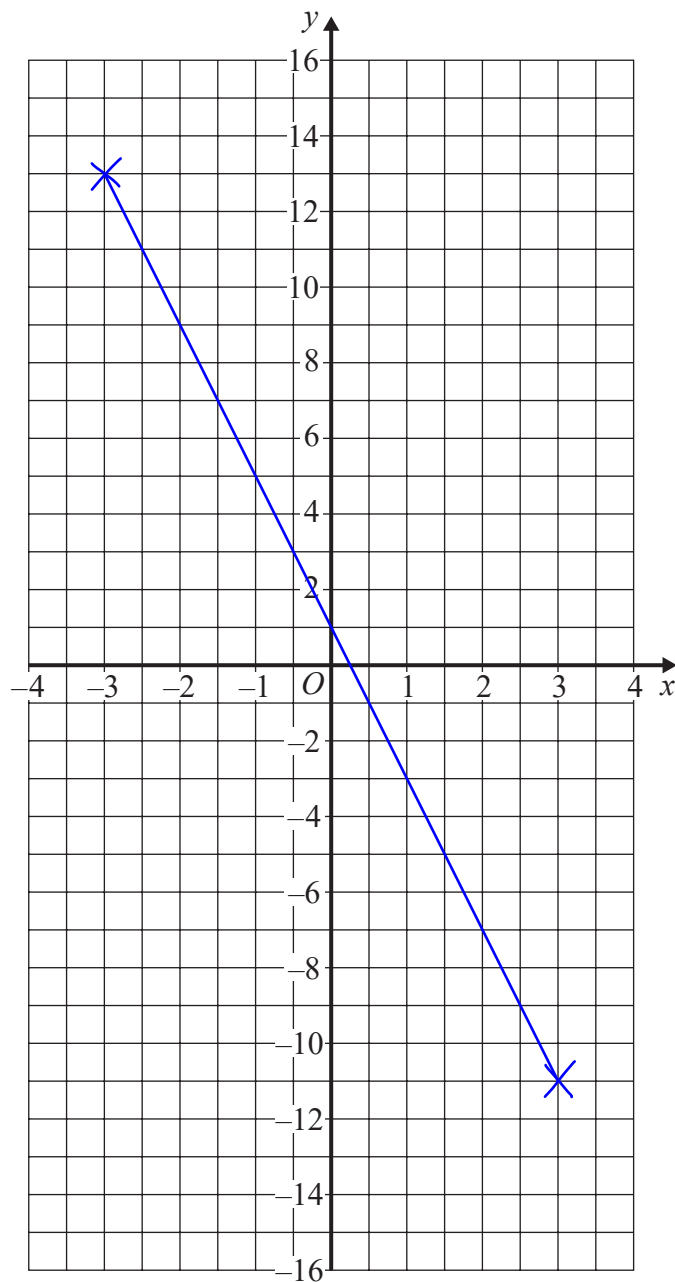
C is two squares down from B

(22 , 20)

(Total for Question 24 is 5 marks)

25 On the grid below, draw the graph of $y = 1 - 4x$ for values of x from -3 to 3

It is a straight line graph as there are no powers of x or y . When $x = -3$, $y = 1 - 4(-3) = 1 - -12 = 1 + 12 = 13$. This gives the coordinate of $(-3, 13)$. When $x = 3$, $y = 1 - 4(3) = 1 - 12 = -11$. This gives the coordinate of $(3, -11)$. Joining up the two points give the graph



(Total for Question 25 is 3 marks)

$$26 \quad \mathbf{a} = \begin{pmatrix} 5 \\ 2 \end{pmatrix} \quad \mathbf{b} = \begin{pmatrix} -1 \\ 7 \end{pmatrix}$$

Work out $2\mathbf{a} + \mathbf{b}$ as a column vector.

$$2 \times 5 - 1 = 9$$

Working out the x components

$$2 \times 2 + 7 = 11$$

Working out the y components

$$\begin{pmatrix} 9 \\ 11 \end{pmatrix}$$

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

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