

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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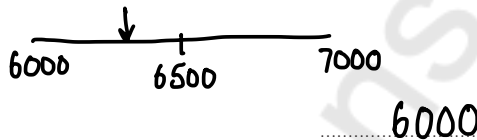
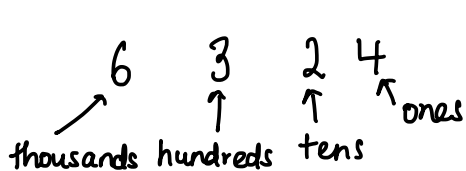
Pearson

Answer ALL questions.

Write your answers in the spaces provided.

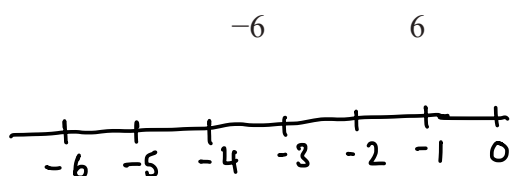
You must write down all the stages in your working.

1 Write 6324 correct to the nearest thousand.



(Total for Question 1 is 1 mark)

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



-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

0.078 0.78 0.87 0.708

.....
0.078 0.708 0.78 0.87

(1)

(Total for Question 2 is 2 marks)

3 Write 20% as a fraction.

$$\frac{20}{100} \stackrel{\div 20}{=} \frac{1}{5}$$

.....
 $\frac{1}{5}$

(Total for Question 3 is 1 mark)



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4 Here is a list of four fractions.

$$\frac{4}{16} \begin{array}{l} \div 4 \\ \equiv \\ \div 4 \end{array} \frac{1}{4} \quad \frac{2}{8} \begin{array}{l} \div 2 \\ \equiv \\ \div 2 \end{array} \frac{1}{4} \quad \frac{15}{60} \begin{array}{l} \div 15 \\ \equiv \\ \div 15 \end{array} \frac{1}{4} \quad \frac{3}{9}$$

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

Write down this fraction.

$\frac{3}{9}$

(Total for Question 4 is 1 mark)

5 Write down the first even multiple of 7

divisible by 2

7 times tables

7 14 21 28 ...

14

(Total for Question 5 is 1 mark)

6 (a) Simplify $3 \times 4t = 4t + 4t + 4t = 12t$

$12t$
(1)

(b) Simplify $8a - 3a + 2a$
 $8a - 3a = 5a$
 $5a + 2a = 7a$

$7a$
(1)

(Total for Question 6 is 2 marks)



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

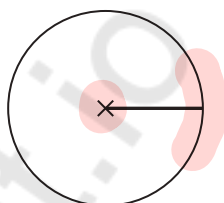
Work out how much Nina pays.

$$\begin{array}{l}
 \div 3 \quad \left\{ \begin{array}{l} 3 \text{ kg} = \text{£}54 \\ 1 \text{ kg} = \text{£}18 \end{array} \right. \div 3 \\
 \times 2 \quad \left\{ \begin{array}{l} 1 \text{ kg} = \text{£}18 \\ 2 \text{ kg} = \text{£}36 \end{array} \right. \times 2
 \end{array}$$

£ 36

(Total for Question 8 is 2 marks)

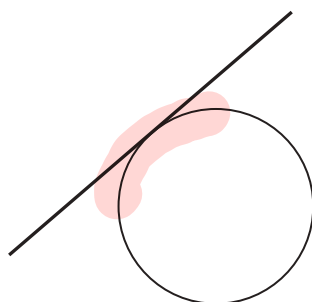
9 The centre of this circle is marked with a cross (×).



(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.

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

$$\pounds 2140 \div 4 = \pounds 535$$

$$\begin{array}{r} 0535 \\ 4 \overline{) 2140} \end{array}$$

£ 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. *divisible by 2*

10
1 10
2 5

Factors of 10 = 1, 2, 5, 10 (1)

(b) All the digits in odd numbers are odd. *not divisible by 2*

2 3 1
↑
even

231 (1)

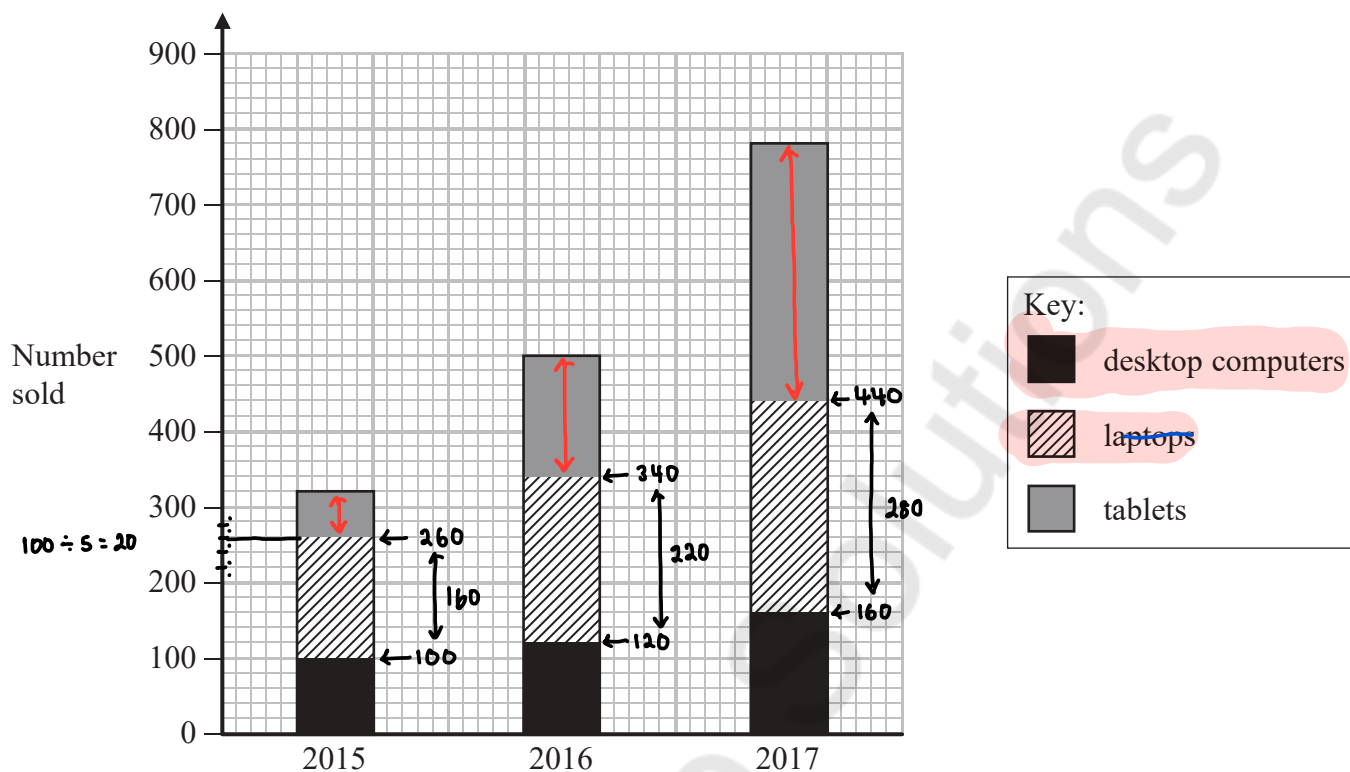
(Total for Question 11 is 2 marks)

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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.

2015 = 160 laptops 160
 2016 = 220 220
 2017 = 280 + 280

 660

 (3)

(c) State the item that had the greatest increase in sales over the 3 years. Give a reason for your answer.

Tablets - height of bar increases in size the most.

(2)



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.

Alex is incorrect - we need to know the costs to work out the profits

(1)

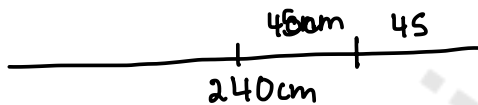
(Total for Question 12 is 7 marks)

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.



$$240 - (45 + 45)$$

$$240 - 90 = 150 \text{ cm left}$$

$$\begin{array}{l} 40 \\ 80 \\ 120 \\ 160 \end{array} \left. \vphantom{\begin{array}{l} 40 \\ 80 \\ 120 \\ 160 \end{array}} \right\} 3 \text{ } 40\text{cm lengths}$$

← 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

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

the amount of salary Isabel saves : the amount of salary she spends = 3 : 7

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

You must show how you get your answer.

| | SAVES | SPENDS |
|--------|---------------------------------|-----------------------|
| GAVIN | 28% | $100\% - 28\% = 74\%$ |
| HARRY | $1 - \frac{3}{4} = \frac{1}{4}$ | $\frac{3}{4}$ |
| ISABEL | 3 | 7 |

| | |
|---|--------------------------------|
| G | $28\% = \frac{28}{100} = 0.28$ |
| H | $\frac{1}{4} = 0.25$ |
| I | $\frac{3}{10} = 0.3$ |

0.3 is largest proportion
Isabel saves the most.

(Total for Question 14 is 4 marks)

15 Work out 15% of 160 grams.

$$\begin{array}{l} 100\% = 160\text{g} \\ \div 10 \left\{ \begin{array}{l} 10\% = 16\text{g} \\ 5\% = 8\text{g} \end{array} \right. \div 10 \\ \div 2 \left\{ \begin{array}{l} 10\% = 16\text{g} \\ 5\% = 8\text{g} \end{array} \right. \div 2 \end{array}$$

$$16\text{g} + 8\text{g} = 24\text{g}$$

.....24..... grams

(Total for Question 15 is 2 marks)



16 $P = 4x + 3y$

$$x = 5$$

$$y = -2$$

(a) Work out the value of P .

$$\begin{aligned} P &= 4(5) + 3(-2) \\ &= 20 - 6 \\ &= 14 \end{aligned}$$

14

(2)

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

$$4e^2 + 8$$

$4e^2 + 8$

(2)

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

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

$$\begin{aligned} 3m - 12 &= 21 \\ + 12 &+ 12 \end{aligned}$$

$$\begin{aligned} 3m &= 33 \\ \div 3 & \quad \quad \quad \div 3 \\ m &= 11 \end{aligned}$$

$$m = 11$$

(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 $1 : n$

N : N'

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

1 : 3
↑

1 : 3

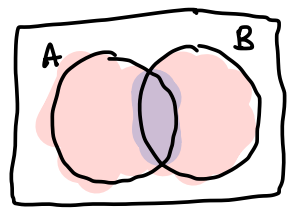
(Total for Question 17 is 2 marks)



18 $A = \{\text{multiples of 5 between 14 and 26}\} = \{15, 20, 25\}$
 $B = \{\text{odd numbers between 14 and 26}\} = \{15, 17, 19, 21, 23, 25\}$

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

↑
 Union = 'or'



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

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

↑
 and

15 and 25 odd multiples of 5
 (1)

(Total for Question 18 is 3 marks)



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

$$2 + 1 = 3$$

$$\frac{1}{7} + \frac{1}{4}$$

$$\frac{1}{7} \xrightarrow{\times 4} \frac{4}{28}$$

$$\text{LCD} = 28$$

$$\frac{1}{4} \xrightarrow{\times 7} \frac{7}{28}$$

$$\frac{4}{28} + \frac{7}{28} = \frac{11}{28}$$

$$3\frac{11}{28}$$

(2)

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

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

$$1\frac{1}{5} = \frac{6}{5}$$

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

$$\frac{6}{5} \times \frac{4}{3} = \frac{24}{15} \div 3 = \frac{8}{5} = 1\frac{3}{5}$$

(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?

$$\begin{array}{l} H : F \qquad F : B \\ 7 : 4 \qquad 8 : 5 \\ \times 2 \quad \times 2 \\ 14 : 8 \qquad 8 : 5 \end{array}$$

$$\begin{array}{l} H : F : B \\ 14 : 8 : 5 \\ \downarrow \times 10 \\ 140 : 80 : 50 \end{array}$$

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.

$$5 \text{ kg} \times 1000 = 5000 \text{ g}$$

$$\frac{5000}{250} = \frac{500}{25} = 20 \text{ bags}$$

$$\begin{array}{r} 20 \\ \times 65 \\ \hline 100 \\ 1200 \\ \hline 1300 \text{ p} \end{array} \xrightarrow{\div 100} \text{£13}$$

$$\text{£13} - \text{£10} = \text{£3 profit.}$$

$$\frac{\text{profit}}{\text{original}} \times 100$$

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

$$0.3 \times 100 = 30$$

$$30\%$$

..... 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.

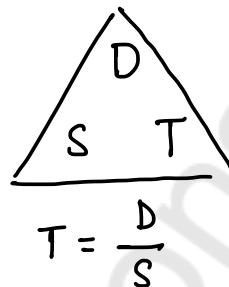
(a) Estimate how many days Juan will take to complete the race.

$$3069.25 \approx 3000 \text{ miles}$$

$$15.12 \approx 15 \text{ mph}$$

$$3000 \div 15 = 200 \text{ hours}$$

$$200 \div 8 = 25 \text{ days}$$



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)?

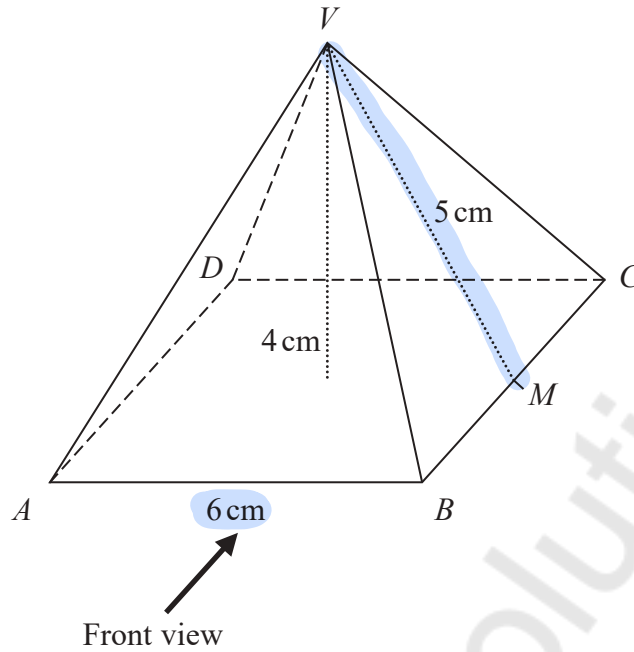
Will decrease. It will take fewer days.

(1)

(Total for Question 22 is 4 marks)

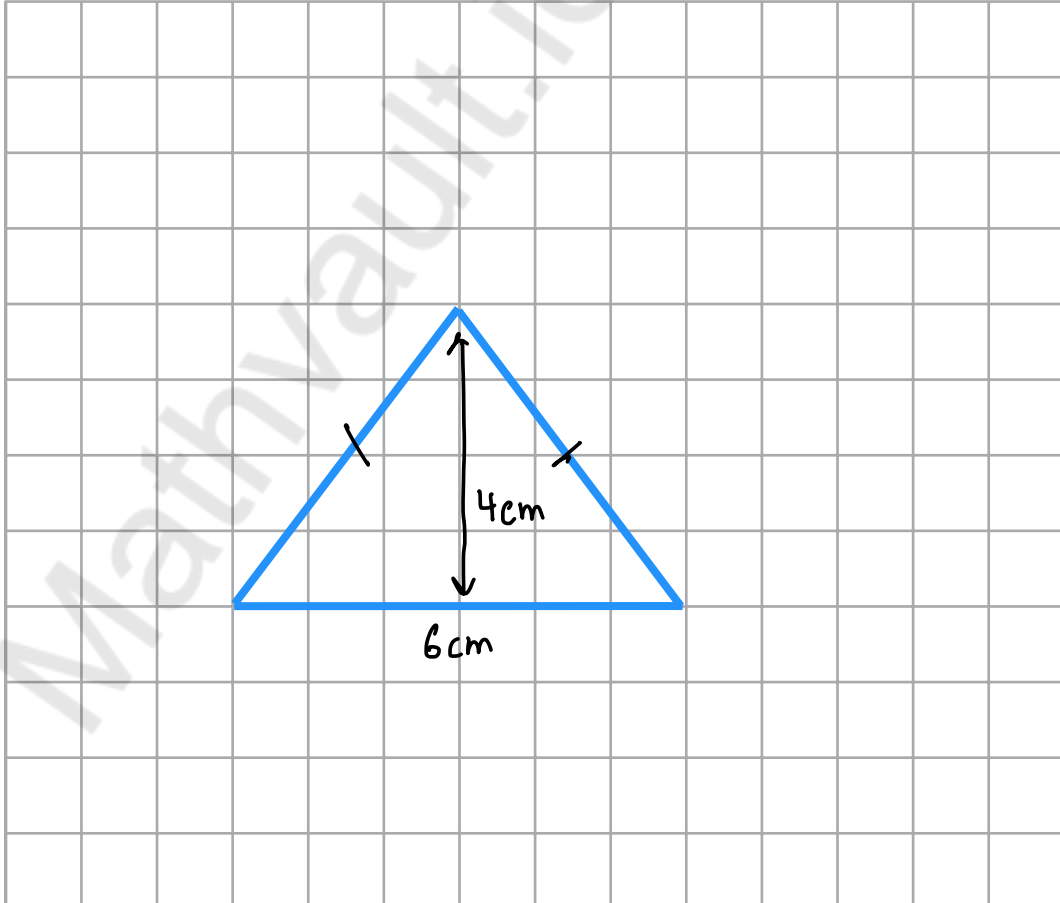


23 Here is a solid square-based pyramid, $VABCD$.



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 $VM = 5\text{ cm}$.

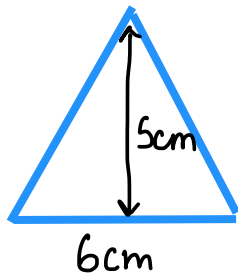
(a) Draw an accurate front elevation of the pyramid from the direction of the arrow.



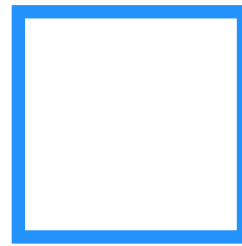
(2)



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



x 4



6cm

6cm

$$\begin{aligned} A &= \frac{1}{2}bh \\ &= \frac{1}{2} \times 6 \times 5 \\ &= \frac{1}{2} \times 30 \\ &= 15 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} A &= l \times w \\ &= 6 \times 6 \\ &= 36 \text{ cm}^2 \end{aligned}$$

$$60 + 36 = 96 \text{ cm}^2$$

$$4 \times 15 = 60 \text{ cm}^2$$

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

(4)

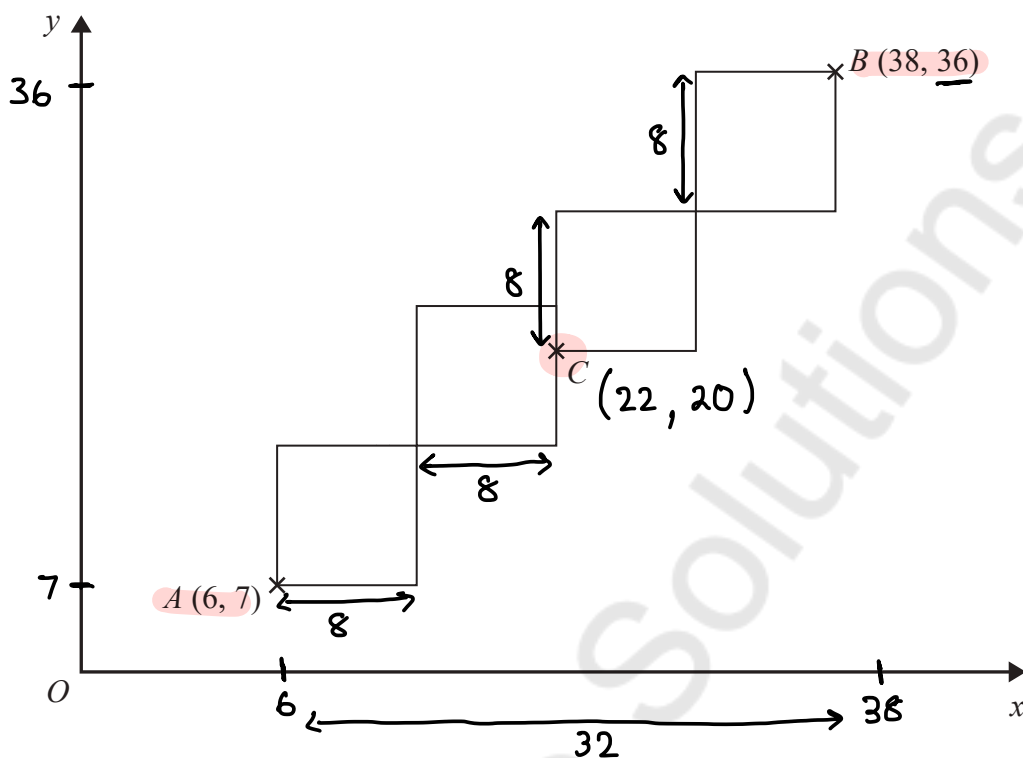
(Total for Question 23 is 6 marks)

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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 .

$$38 - 6 = 32$$

$$32 \div 4 = 8$$

$$6 + 8 + 8 = 22$$

$$36 - 8 - 8 = 20$$

(..... 22 , 20))

(Total for Question 24 is 5 marks)



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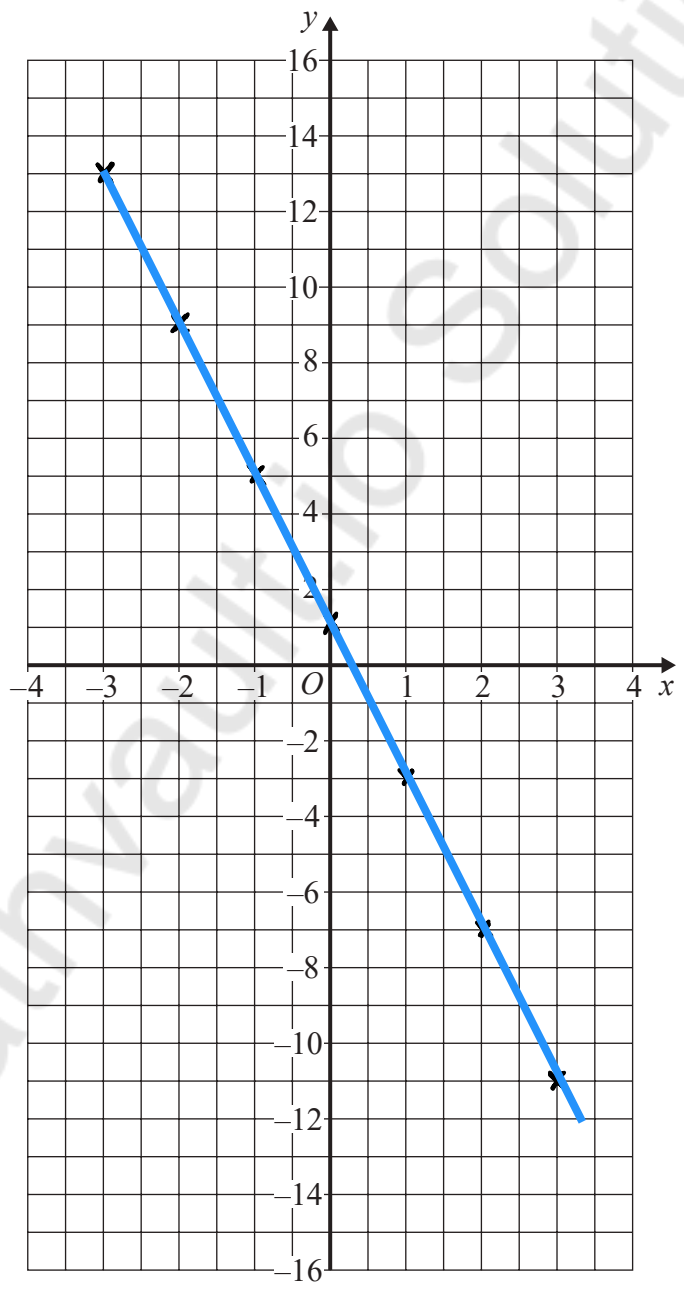
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25 On the grid below, draw the graph of $y = 1 - 4x$ for values of x from -3 to 3

| | | | | | | | |
|-----|----|----|----|---|----|----|-----|
| x | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| y | 13 | 9 | 5 | 1 | -3 | -7 | -11 |

Handwritten calculations for each x value:

- $x = -3$: $1 - 4(-3) = 1 + 12 = 13$
- $x = -2$: $1 - 4(-2) = 1 + 8 = 9$
- $x = -1$: $1 - 4(-1) = 1 + 4 = 5$
- $x = 0$: $1 - 4(0) = 1 - 0 = 1$
- $x = 1$: $1 - 4(1) = 1 - 4 = -3$
- $x = 2$: $1 - 4(2) = 1 - 8 = -7$
- $x = 3$: $1 - 4(3) = 1 - 12 = -11$



(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.

$$2 \times \mathbf{a} + \mathbf{b}$$

$$2 \times \begin{pmatrix} 5 \\ 2 \end{pmatrix} = \begin{pmatrix} 10 \\ 4 \end{pmatrix}$$

$$\begin{pmatrix} 10 \\ 4 \end{pmatrix} + \begin{pmatrix} -1 \\ 7 \end{pmatrix} = \begin{pmatrix} 9 \\ 11 \end{pmatrix}$$

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

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

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