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

Centre Number

Candidate Number

Mathematics
Paper 1 (Non-Calculator)

Foundation Tier

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.

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.

........................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

........−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   0.708   0.78   0.87........

(1)

(Total for Question 2 is 2 marks)

3   Write 20% as a fraction.

$\dfrac{20}{100}$

(Total for Question 3 is 1 mark)

. list of four fractions.

$$\frac{4}{16} \qquad \frac{2}{8} \qquad \frac{15}{60} \qquad \frac{3}{9}$$

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

Write down this fraction.

$$\frac{4}{16} \xrightarrow{\div 4} \frac{1}{4} \xleftarrow{\div 4}$$

$$\frac{2}{8} \xrightarrow{\div 2} \frac{1}{4} \xleftarrow{\div 2}$$

$$\frac{15}{60} \xrightarrow{\div 15} \frac{1}{4} \xleftarrow{\div 15}$$

$$\frac{3}{9} \xrightarrow{\div 3} \frac{1}{3} \xleftarrow{\div 3}$$

$$\frac{3}{9}$$

....

(Total for Question 4 is 1 mark)

---

5 Write down the first even multiple of 7.

$$2 \times 7 = 14$$

.... **14**

(Total for Question 5 is 1 mark)

---

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

.... **12t**

(1)

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

$$8 - 3 + 2 = 7$$

.... **7a**

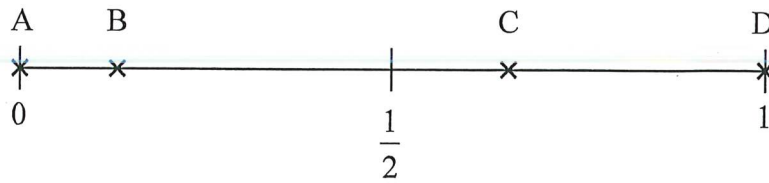**(1)**

(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     B                    C          D
    *-----x--------------------x----------*
    0                    1                 1
                         ―
                         2
```

(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 $\dfrac{2}{3}$

$3 + 1 + 2 = 6$

So $12 - 6 = 6$ counters are green

2 counters are yellow

$$\dfrac{6 + 2}{12} = \dfrac{8}{12} = \dfrac{2}{3}$$

(3)

(Total for Question 7 is 5 marks)

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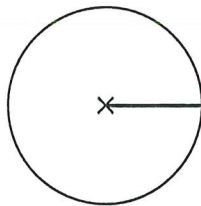Nina buys 2 kg of the meat.

Work out how much Nina pays.

$54 \div 3 = 18$

$18 \times 2 = 36$

£ ....**36**...
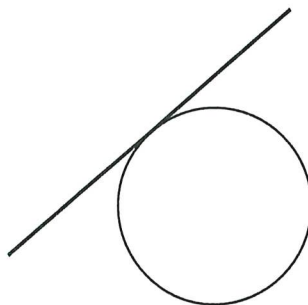
(Total for Question 8 is 2 marks)

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.

1280
640 +
220
_____
2140

535
4) 2140

£ ~~2140~~ 535·00

(Total for Question 10 is 3 marks)

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.

1 is a factor of every number

(1)

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

Even ↘ *23*

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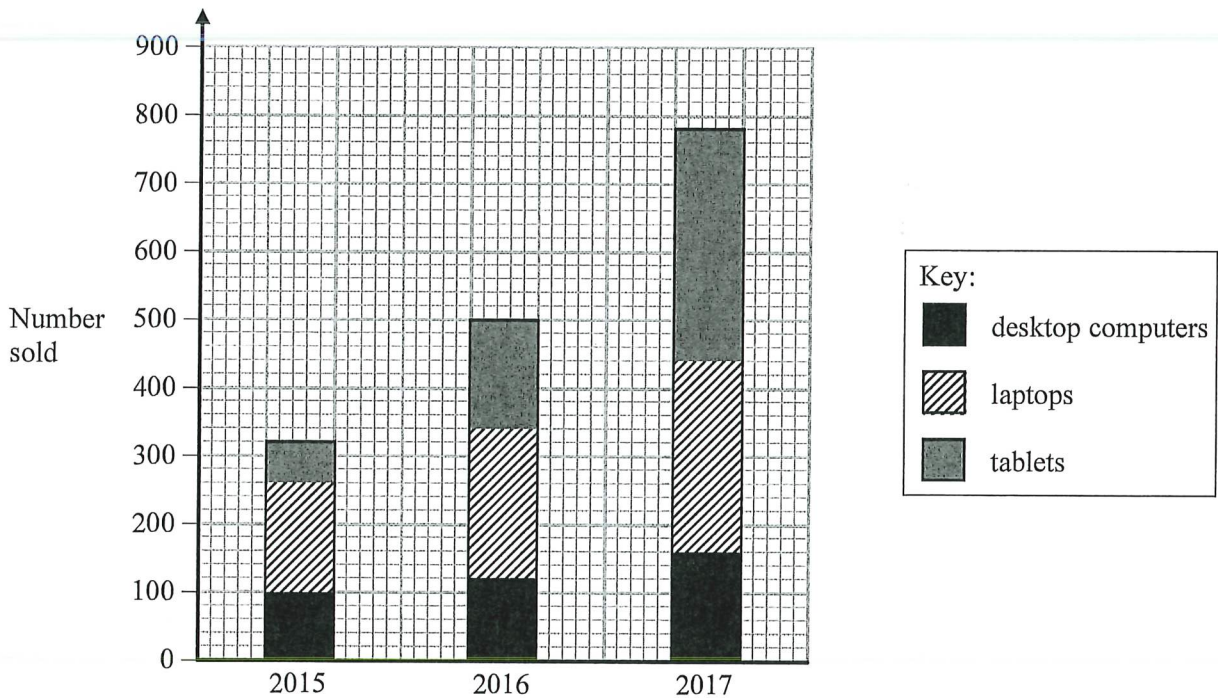
(a) Write down the number of desktop computers sold in 2015

100

(1)

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

160 + 220 + 280 = 660

660

(3)

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

tablets because number rises from 60 to 340 which is a rise of 280. laptops rise from 160 to 280 (120) and desktops rise from 100 to 160 (60).

(2)

"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.

You can't say because you don't know the profit that each item generates.

(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.

$$45 + 45 = 90$$
$$240 - 90 = 150$$
$$150 \div 40 = 3 \cdot 75$$

So peter cuts 3 40 cm lengths of wire

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.

Gavin saves 28%

Harry saves $1 - \frac{3}{4} = \frac{1}{4} = 25\%$

Isabel saves $\frac{3}{3+7} = \frac{3}{10} = 30\%$

Isabel saves the most.

(Total for Question 14 is 4 marks)

15 Work out 15% of 160 grams.

$$\frac{15}{100} \times 160 = \frac{15^3}{10_2} \times 16 = \frac{48}{2} = 24g$$

.... 24 .... grams

(Total for Question 15 is 2 marks)

y

-2

(a) Work out the value of P.

$$P = 4(5) + 3(-2)$$
$$= 20 + (-6)$$
$$= 14$$

14

(2)

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

	e	$+2$
$4e$	$4e^2$	$+8e$

$4e^2 + 8e$

(2)

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

	m	-4
3	$3m$	-12

$+12\Big($ $3m - 12 = 21$ $\Big)+12$

$\div3\Big($ $3m = 33$ $\Big)\div3$

$m = 11$

$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*

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

.... 1 : 3 ....

(Total for Question 17 is 2 marks)

ultiples of 5 between 14 and 26} $= \{15, 20, 25\}$

{odd numbers between 14 and 26}

$= \{15, 17, 19, 21, 23, 25\}$

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

OR or Union

15, 17, 19, 20, 21, 23, 25   *Don't repeat the numbers.*

(2)

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

And

15, 25

(1)

(Total for Question 18 is 3 marks)

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

$2 + 1 + \frac{1}{7} + \frac{1}{4} = 3 + \frac{1}{7} + \frac{1}{4} = 3\frac{11}{28}$

$\frac{1}{7} + \frac{1}{4} = \frac{4+7}{28} = \frac{11}{28}$

$3\frac{11}{28}$

(2)

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

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

$1\frac{1}{5} \div \frac{3}{4} = \frac{(1\times5)+1}{5} \div \frac{3}{4} = \frac{6}{5} \div \frac{3}{4} = \frac{6}{5} \times \frac{4}{3}$

$= \frac{2}{5} \times \frac{4}{1} = \frac{8}{5} = 1\frac{3}{5}$

$1\frac{3}{5}$

(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?

H   F   B
7   4
            ⟩ ×2
    8   5

        14 8   5
×10 (⟩ 50 bungalows × 10
        140   50

......140 houses......

(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.

$\frac{1000}{250} = 4$

$4 \times 5 = 20$

$£10 \div 5 = £2$ per kg

$20 \times 65 = £13.00$

Percentage Profit $= \left(\frac{13}{10} \times 100\right) - 100$

$= (1.3 \times 100) - 100$

$= 30\%$

.... 30 %

(Total for Question 21 is 4 marks)

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.

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

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

.... 25 days ....

(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 Juan is cycling faster.

(1)

(Total for Question 22 is 4 marks)

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

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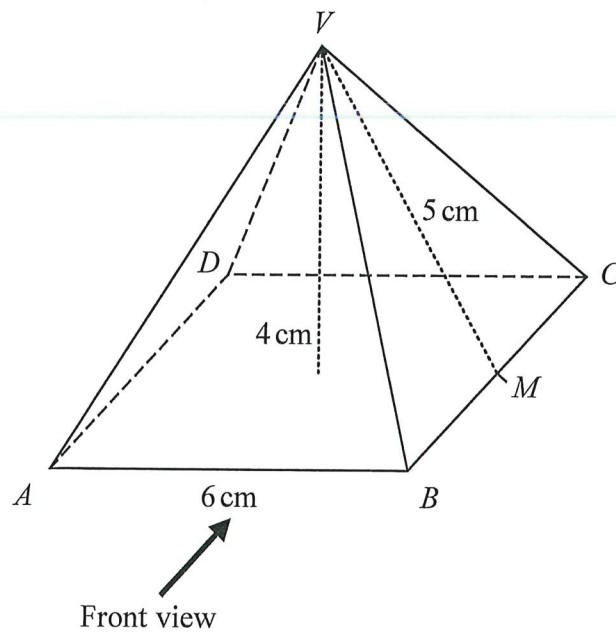
The base of the pyramid is a square of side 6 cm.
The height of the pyramid is 4 cm.
M is the midpoint of *BC* and *VM* = 5 cm.

(*a*) Draw an accurate front elevation of the pyramid from the direction of the arrow.
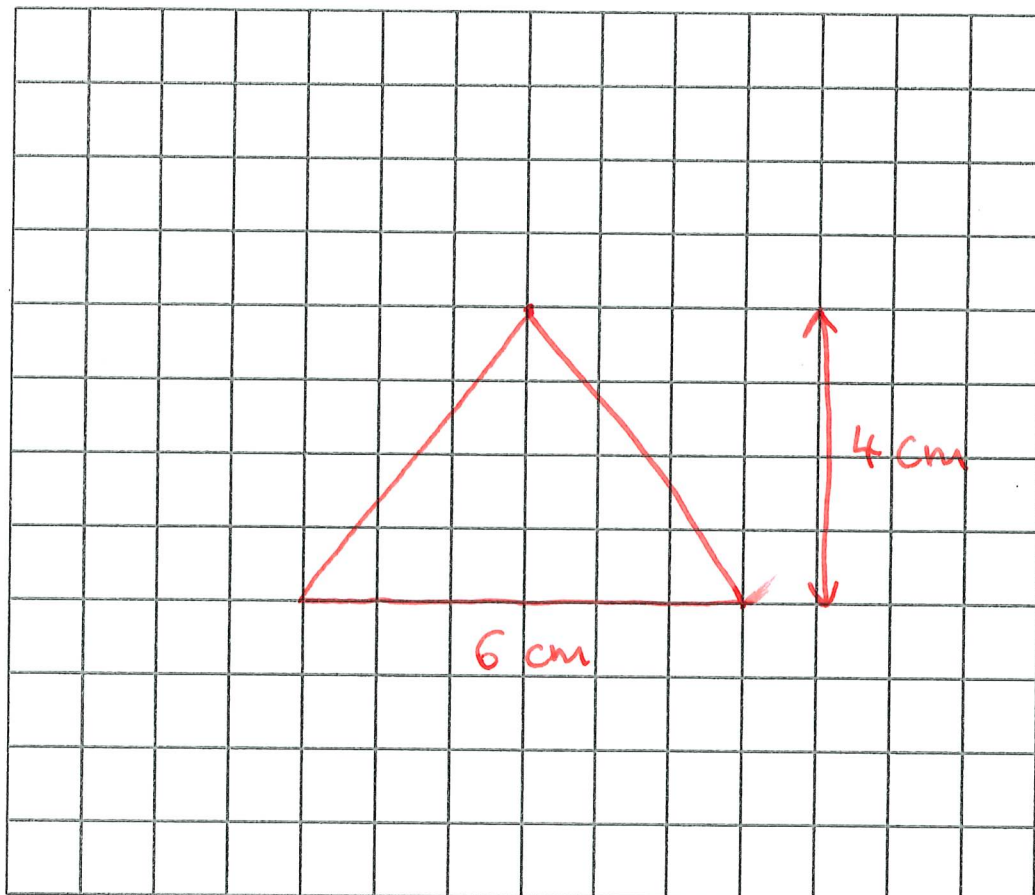
(2)

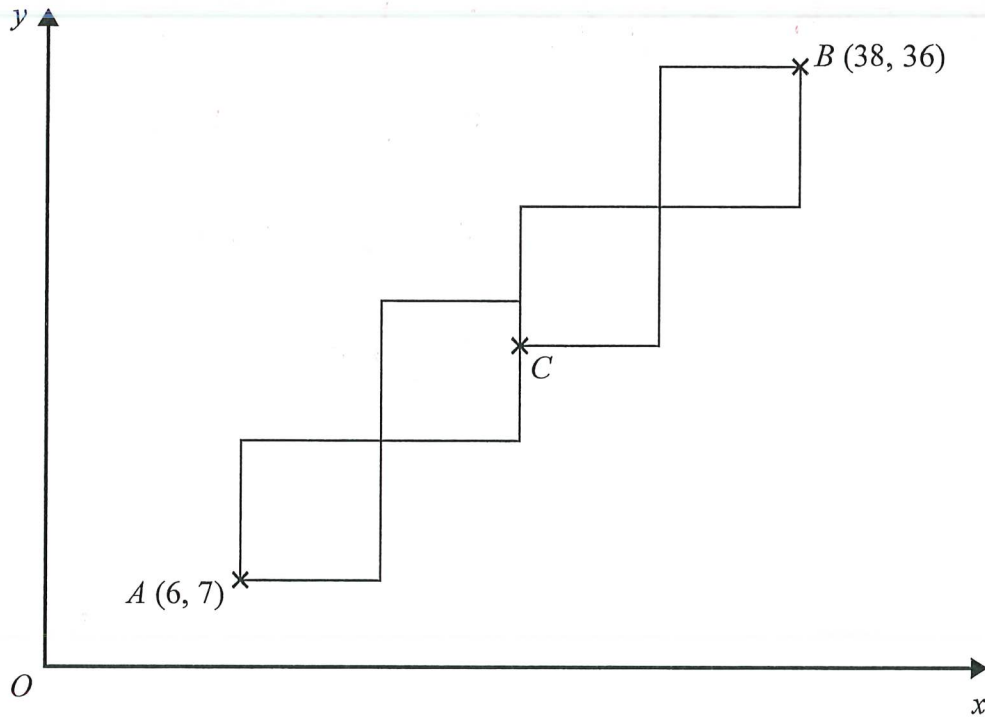(b) Work out the total surface area of the pyramid.

$$4\left(\tfrac{1}{2}bh\right) + (6 \times 6) = 4\left(\tfrac{1}{2} \times 5 \times 6\right) + 36$$
$$= 4(15) + 36$$
$$= 60 + 36$$
$$= 96$$

.... 96cm² ....

(4)

(Total for Question 23 is 6 marks)

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*.

$$\frac{38-6}{4} = \frac{32}{4} = 8$$

$$x = 6 + 8 + 8 = 22$$

$$y = 36 - 8 - 8 = 20$$

(.......... 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.

x	-3	0	3
y	13	1	-11
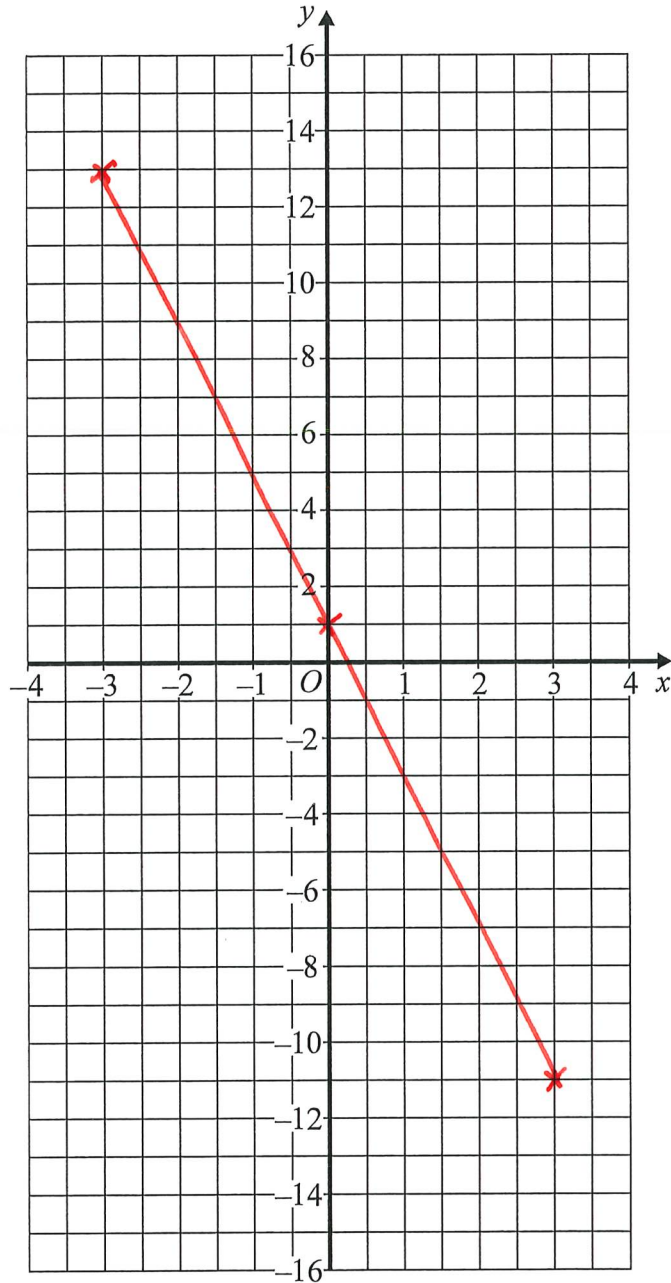
(Total for Question 25 is 3 marks)

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

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

$$2\begin{bmatrix} 5 \\ 2 \end{bmatrix} + \begin{bmatrix} -1 \\ 7 \end{bmatrix} = \begin{bmatrix} 10 \\ 4 \end{bmatrix} + \begin{bmatrix} -1 \\ 7 \end{bmatrix} = \begin{bmatrix} 9 \\ 11 \end{bmatrix}$$

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

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

Candidate surname | Other names

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

Centre Number | Candidate Number

Time 1 hour 30 minutes

Paper reference **1MA1/1F**

Mathematics

PAPER 1 (Non-Calculator)
Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, Formulae Sheet (enclosed). Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
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- Answer the questions in the spaces provided
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- You must **show all your working**.
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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.
- Good luck with your examination.

Turn over ▶

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

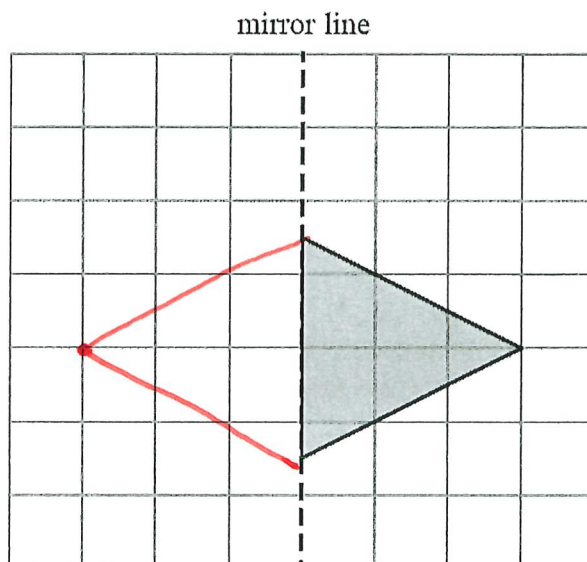1   Change 40 centimetres into millimetres.

$$40 \times 10 = 400$$

...................**400**................... millimetres

(Total for Question 1 is 1 mark)

2   Simplify $e + e + e + e$

...................**4e**...................

(Total for Question 2 is 1 mark)

3   On the grid, reflect the shaded triangle in the mirror line.

mirror line

(Total for Question 3 is 1 mark)

4 Write down the value of the 6 in the number 16 007

......*Six thousand or 6000*......

(Total for Question 4 is 1 mark)

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

0.50

$\dfrac{1}{2}$ 0.55   *0.45*

45%

......*45%*   *$\frac{1}{2}$*   *0.55*......

(Total for Question 5 is 1 mark)

6 The pictogram gives information about the number of hours of sunshine on a Saturday and on a Sunday.

4 × 2

Saturday	☀ ☀ ☀ ☀ *8*
Sunday	☀ ☀ *4*

Key: ☀ represents 2 hours of sunshine

Work out the number of hours of sunshine on Saturday.

......*8*...... hours

(Total for Question 6 is 1 mark)

7   Simon buys some candles.
    Each candle costs £2

    Simon pays with a £20 note.
    He gets £6 change.
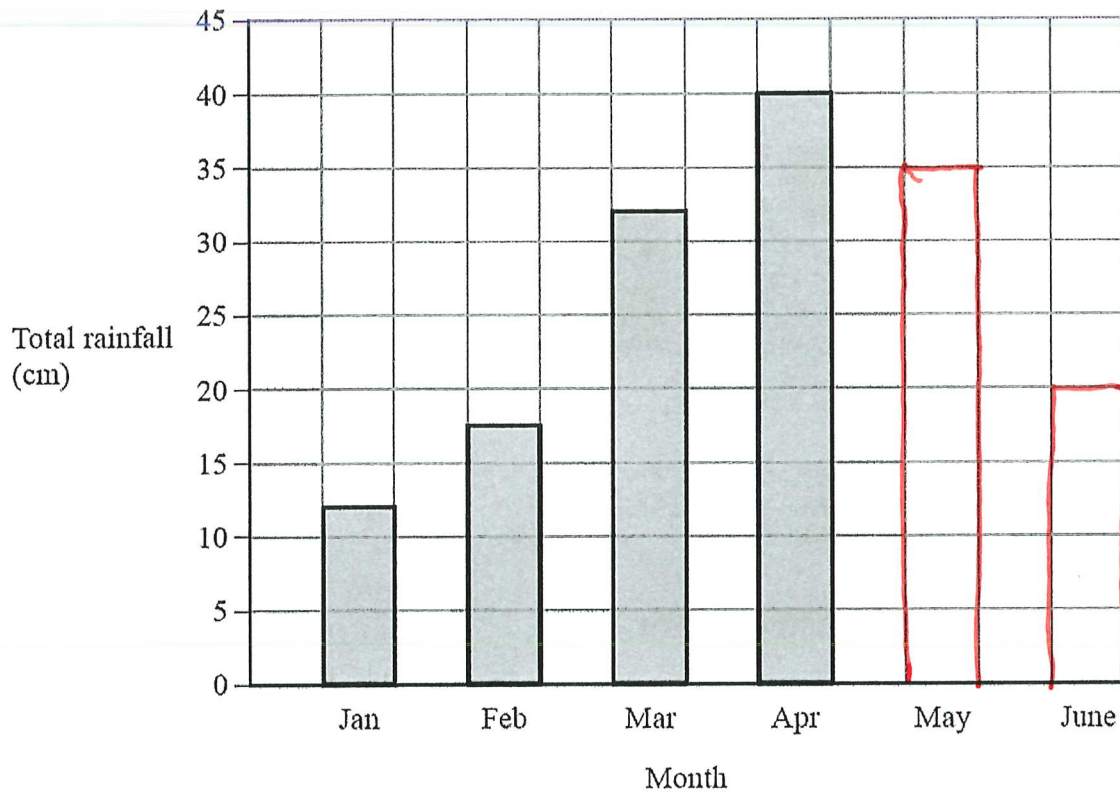
    Work out the number of candles Simon buys.

$$20 - 6 = 14$$
$$14 \div 2 = 7$$

.... 7 Candles

(Total for Question 7 is 3 marks)

8 The bar chart shows information about the total rainfall each month for four months in a city.

Month

In May, the total rainfall was 35 cm.
In June, the total rainfall was 20 cm.

(a) Use this information to complete the bar chart.

(2)

Rupa says,
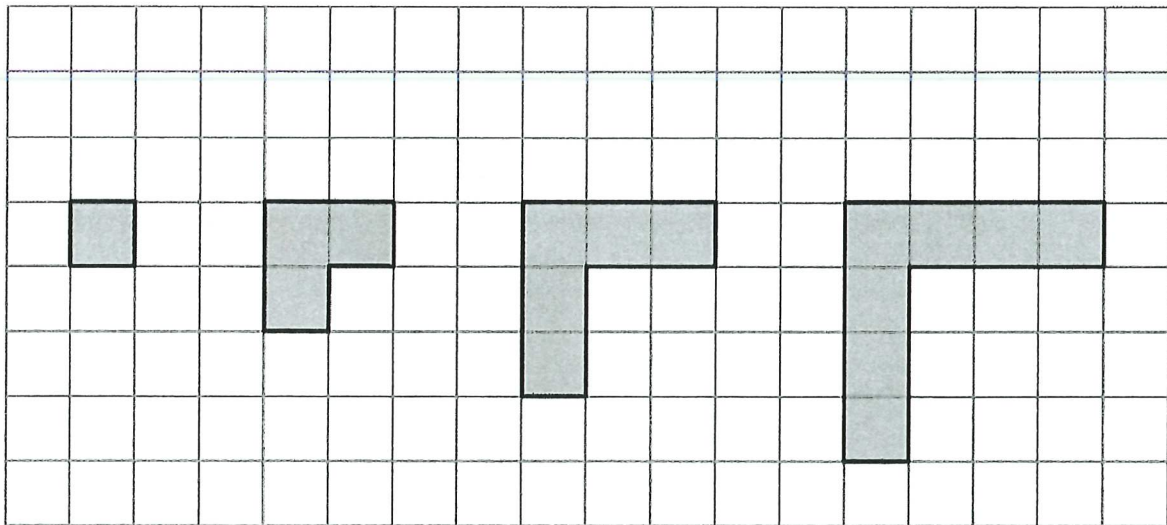"In February there was 15.5 cm of rainfall because the bar is half a square above 15"

(b) Explain why Rupa is incorrect.

The scale is 1 box to 5cm. ½ a box
represents 2½ cm so the rainfall reading
should be 17.5 cm.

(1)

(Total for Question 8 is 3 marks)

9 Here is a sequence of patterns made from grey square tiles.
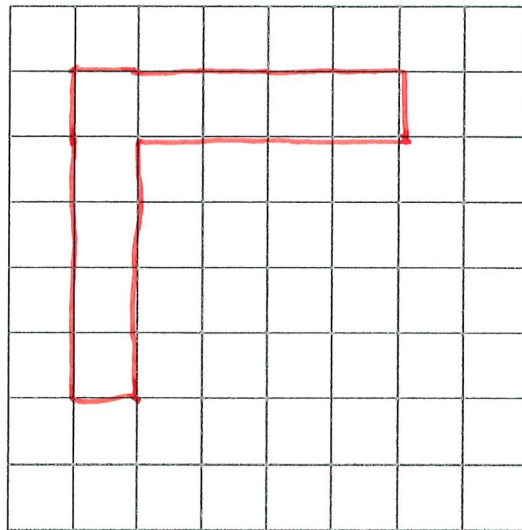

Pattern number 1	Pattern number 2	Pattern number 3	Pattern number 4
1	3	5	7

(a) On the grid below, draw Pattern number 5

(1)

(b) Complete the table.

Pattern number	1	2	3	4	5	6
Number of squares	1	3	5	7	9	11

(1)

(Total for Question 9 is 2 marks)

10 In Norway last year, the lowest temperature was −15°C.
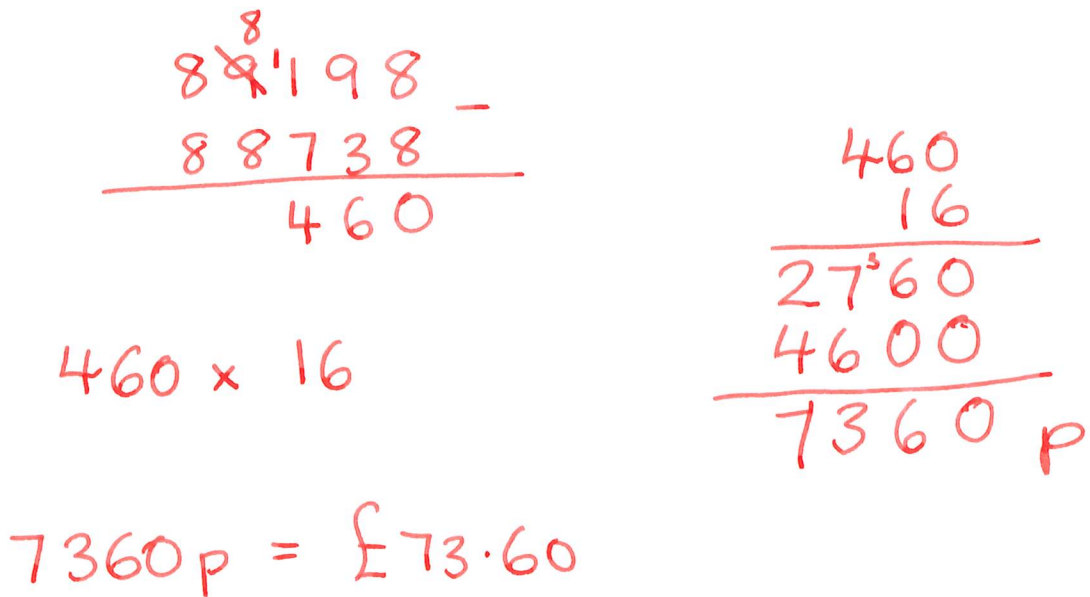In Norway last year, the highest temperature was 42°C greater than the lowest temperature.

Work out the highest temperature in Norway last year.

$$\begin{array}{r} \overset{3}{\cancel{4}}{}^{1}2 \\ 15\ - \\ \hline 27 \end{array}$$

+42°C

−15°C 0°C 27°C

15°C 27°C

.................27°.................° C

(Total for Question 10 is 2 marks)
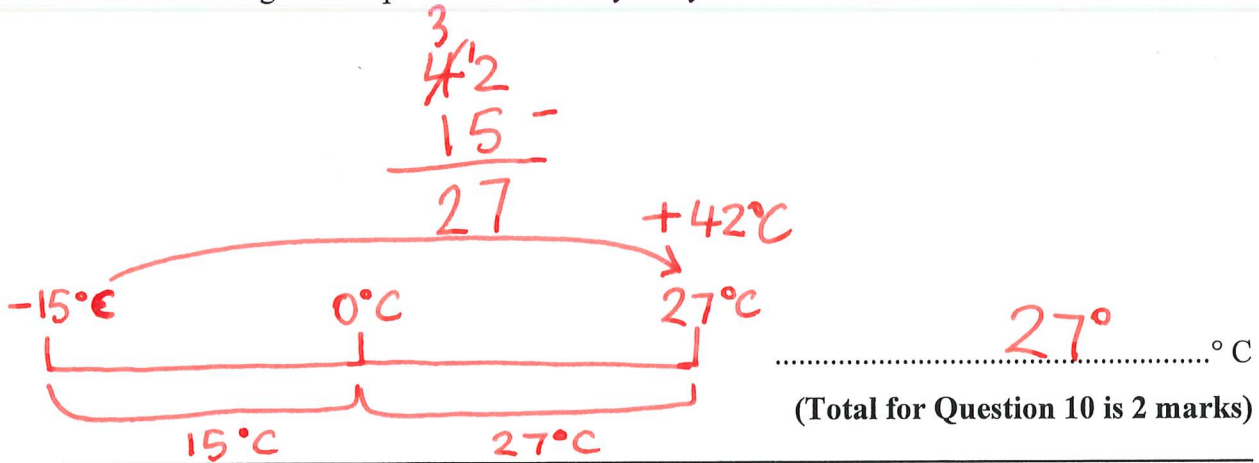
11 At the end of October, Fiona's electricity meter reads 88 738 kWh.
At the end of November, her electricity meter reads 89 198 kWh.

Each kWh of electricity Fiona uses costs 16p

Work out how much Fiona had to pay for the electricity she used in November.

$$\begin{array}{r} 8\overset{8}{\cancel{9}}{}^{1}198\ - \\ 88738\ - \\ \hline 460 \end{array}$$

$$\begin{array}{r} 460 \\ 16 \\ \hline 27^{3}60 \\ 4600 \\ \hline 7360 \ p \end{array}$$

460 × 16

7360p = £73.60

.................£73.60.................

(Total for Question 11 is 4 marks)

12 (*a*) Work out $\dfrac{5}{12} + \dfrac{1}{6}$

$$\frac{5}{12} + \frac{2}{12} = \frac{7}{12}$$

$\dfrac{7}{12}$

(2)

(*b*) Work out $\dfrac{3}{10} \times \dfrac{5}{8}$

Give your answer as a fraction in its simplest form.

$$\frac{3}{\cancel{10}_{2}} \times \frac{\cancel{5}^{1}}{8} = \frac{3}{16}$$

$\dfrac{3}{16}$

(2)

(Total for Question 12 is 4 marks)

13 There are 15 sweets in a jar.
4 of the sweets are red.

Jill takes at random a sweet from the jar.

(a) Write down the probability that the sweet is red.

$$\frac{4}{15}$$

....
(1)

There are only green counters and blue counters in a bag.

A counter is taken at random from the bag.
The probability that the counter is green is 0.3

(b) Find the probability that the counter is blue.

$$0.\overset{1}{\cancel{0}}$$
$$0.3^-$$
$$\overline{0.7}$$

.... 0.7 ....
(1)

(Total for Question 13 is 2 marks)

14 $y = 6x - 5$

Work out the value of y when $x = 4$

$$y = 6(4) - 5$$
$$= 24 - 5$$
$$= 19$$

$y =$ .... 19 ....

(Total for Question 14 is 2 marks)

15 (*a*) Work out an estimate for the value of 92 × 1.63
You must show all your working.

90 × 2 = 180

Must show the estimate you have made to one sig. fig.

180

(2)

Given that

2.96 × 3.2 = 9.472   × 100

(*b*) find the value of 29.6 × 32

× 10   × 10

947.2

(1)

(Total for Question 15 is 3 marks)

16 Savio leaves his home at 07 30 to drive to work.

He drives a distance of 50 miles.

Savio thinks he drives at an average speed of 40 miles per hour.

(a) If Savio is correct, at what time will he arrive at work?

$$40\overline{)50}\ \ 1\ r\ 10$$

$$1\frac{10}{40} = 1\frac{1}{4} = 1\ hr\ and\ 15\ mins$$

7:30   8:30   8:45

+1 hr   +15

.... 8.45 ....

(3)
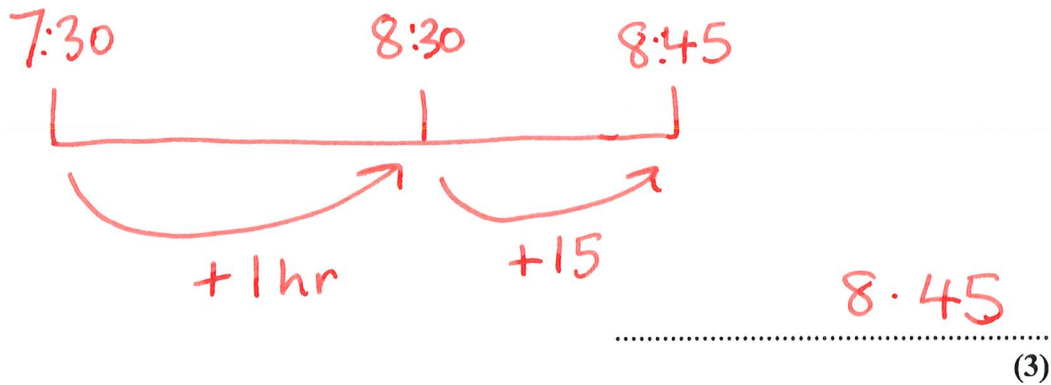
In fact, Savio's average speed was greater than 40 miles per hour.

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

Savio will arrive earlier than 8.45

(1)

(Total for Question 16 is 4 marks)

17 72 people did a test.

20 of the 32 adults who did the test passed.
6 of the children who did the test failed.

(a) Use this information to complete the frequency tree.

72 → adult → 32
32 → passed → 20
32 → failed → 12
72 → child → 40
40 → passed → 34
40 → failed → 6
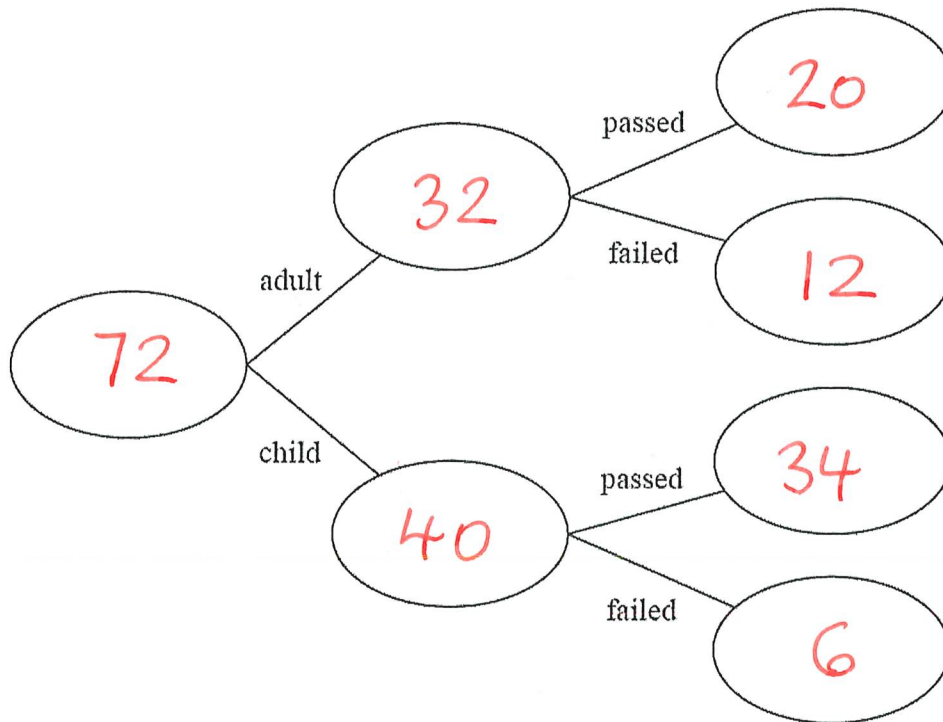
(3)

One of these people is picked at random.

(b) Find the probability that this person is an adult who failed the test.

$$\frac{12}{72} = \frac{1}{6}$$

(2)

(Total for Question 17 is 5 marks)

18   Here is a list of ingredients for making 10 scones.

Ingredients for 10 scones

75 g	butter
350 g	self-raising flour
40 g	sugar
150 ml	milk
2	eggs

Mia wants to make 25 scones.
Work out how much sugar she needs.

$$25 \div 10 = 2.5$$

$$40 \times 2.5 = 100g$$

.... 100 .... g

(Total for Question 18 is 2 marks)

19   Increase 240 by 20%

$$\frac{100 + 20}{100} \times 240 = 1.2 \times 240$$

$$= 288.0$$

```
  240
  1.2×
_____
  480
 2400
_____
 288.0
```

.... 288 ....

(Total for Question 19 is 3 marks)

20 The diagram shows three identical rectangles **A**, **B** and **C**.

$\frac{3}{8}$ {

} $\frac{2}{11}$

Rectangle **A**   Rectangle **B**   Rectangle **C**
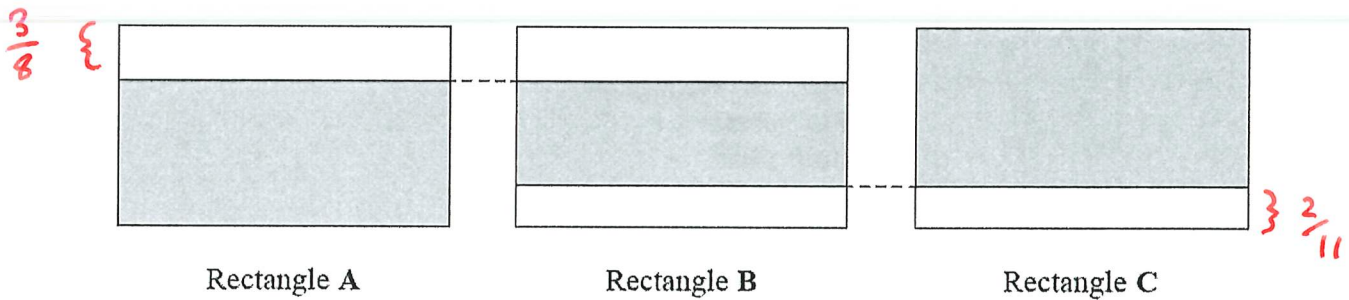
$\frac{5}{8}$ of rectangle **A** is shaded.

$\frac{9}{11}$ of rectangle **C** is shaded.

Work out the fraction of rectangle **B** that is shaded.

$$\frac{3}{8} + \frac{2}{11} = \frac{22+16}{88} = \frac{38}{88} = \frac{19}{44} \quad \text{unshaded}$$

$$1 = \frac{44}{44}$$

$$\frac{44}{44} - \frac{19}{44} = \frac{25}{44} \quad \text{shaded}$$

$\frac{25}{44}$

....

(Total for Question 20 is 3 marks)

21 Here are the ages, in years, of 15 people.

19	28	29	33	27
27	37	25	27	37
17	45	47	25	26

Show this information in a stem and leaf diagram.

Unordered Stem and Leafe

```
10 | 9 7
20 | 8 9 7 7 5 7 5 6
30 | 3 7 7
40 | 5 7
```

```
10 | 7 9
20 | 5 5 6 7 7 7 8 9
30 | 3 7 7
40 | 5 7
```

Key: 10 | 7 means 17

(Total for Question 21 is 3 marks)

22 The centimetre grid shows the plan and the front elevation of a cylinder.

3cm

5cm
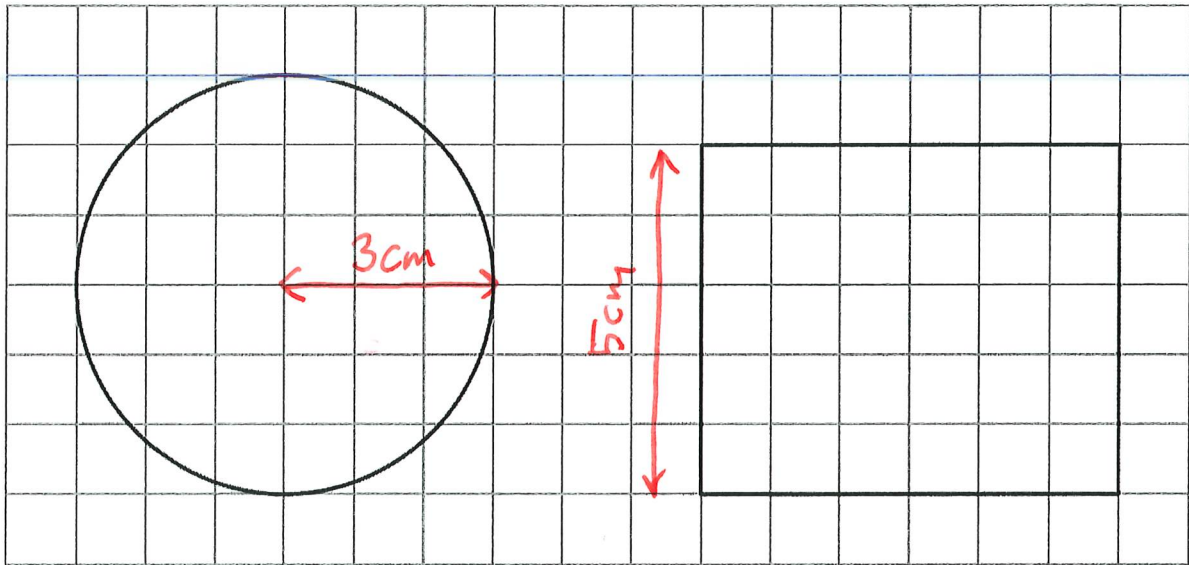
Plan   Front elevation

Work out the volume of the cylinder.
Give your answer in terms of π

$$V = \pi r^2 h$$
$$= \pi \times 3 \times 3 \times 5$$
$$= 45\pi \ cm^3$$

45 π cm3

(Total for Question 22 is 3 marks)

23 Solve $7x - 27 < 8$

$$+27 \left(\begin{matrix} 7x - 27 < 8 \\ 7x < 35 \\ x < 5 \end{matrix} \right) \begin{matrix} +27 \\ \div 7 \end{matrix}$$

$$\div 7 \left(\right) \div 7$$

$x < 5$

(Total for Question 23 is 2 marks)

24 Write 124 as a product of its prime factors.

124

31   4

2   2
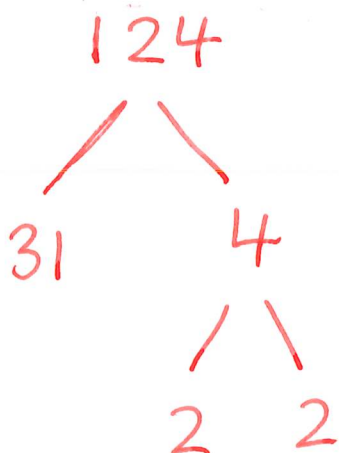
$2^2 \times 31$

(Total for Question 24 is 2 marks)

25 A delivery company has a total of 160 cars and vans.

the number of cars : the number of vans = 3 : 7

Each car and each van uses electricity or diesel or petrol.

$\frac{1}{8}$ of the cars use electricity.

25% of the cars use diesel.
The rest of the cars use petrol.

Work out the number of cars that use petrol.
You must show all your working.

Cars

$$\frac{3}{3+7} \times 160 = \frac{3}{10} \times 160 = 3 \times 16 = 48$$

Vans

$$160 - 48 = 112$$

Cars Electricity

$$\frac{1}{8} \times 48 = 6$$

Diesel

$$25\% \times 48 = \frac{25}{100} \times 48 = \frac{1}{4} \times 48 = 12$$

Cars Petrol

$$48 - (6 + 12) = 48 - 18 = 30$$

30 cars

(Total for Question 25 is 5 marks)

26 (a) Write 1.63×10^{-3} as an ordinary number.

000001.63

0.00163
....
(1)

(b) Write 438 000 in standard form.

4 38000

4.38×10^{5}
....
(1)

(c) Work out $(4 \times 10^3) \times (6 \times 10^{-5})$
     Give your answer in standard form.

$4 \times 6 = 24$
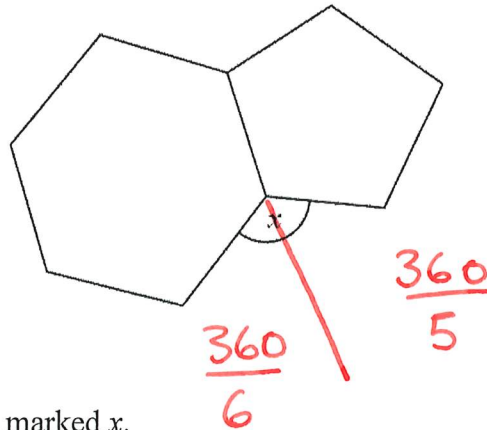
$10^3 \times 10^{-5} = 10^{-2}$

24×10^{-2}

$= 2.4 \times 10^{-1}$

2.4×10^{-1}
....
(2)

(Total for Question 26 is 4 marks)

27 Here is a regular hexagon and a regular pentagon.

$\frac{360}{6}$

$\frac{360}{5}$

Work out the size of the angle marked x.
You must show all your working.

$\frac{360}{6} = 60$

$\frac{360}{5} = 72$

$60 + 72 = 132°$

.....................................132.....°

(Total for Question 27 is 3 marks)

28 (*a*) Complete the table of values for $y = x^2 - 3x + 1$

x	−1	0	1	2	3	4
y	5	1	−1	−1	1	5

(2)

$2^2 - 3(2) + 1 = -1$ $4^2 - 3(4) + 1 = 5$

$3^2 - 3(3) + 1 = 1$ $(-1)^2 - 3(-1) + 1 = 5$

(*b*) On the grid, draw the graph of $y = x^2 - 3x + 1$ for values of x from −1 to 4

$x = 0.4$ $x = 2.6$
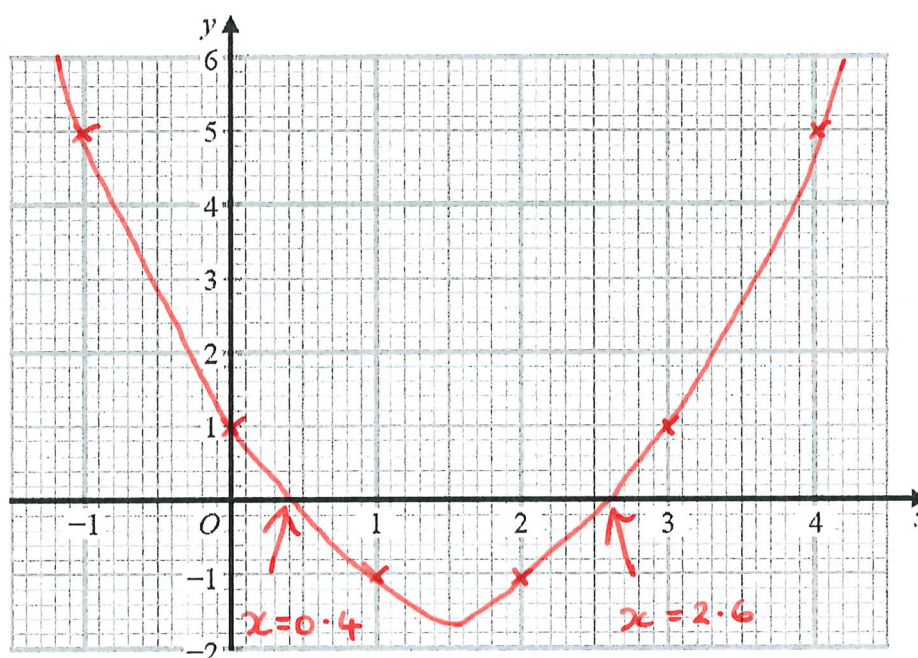
(2)

(*c*) Using your graph, find estimates for the solutions of the equation $x^2 - 3x + 1 = 0$

0.4 or 2.6

(2)

(Total for Question 28 is 6 marks)

29 Here are two cubes, **A** and **B**.

3 cm

4 cm

A

B
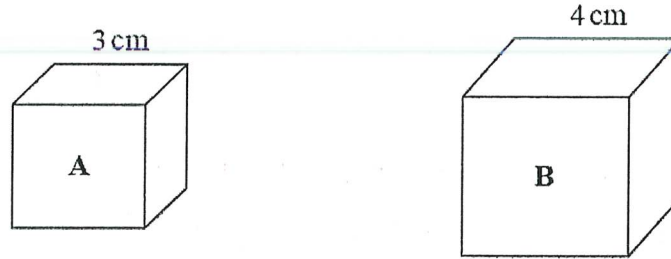
Cube **A** has a mass of 81 g.

Cube **B** has a mass of 128 g.

Work out

the density of cube **A** : the density of cube **B**

Give your answer in the form $a : b$, where a and b are integers.

$$\frac{81}{3^3} : \frac{128}{4^3}$$

$$\frac{81}{27} : \frac{128}{64}$$

$$3 : 2$$

.... 3 : 2 ....

(Total for Question 29 is 3 marks)

30 Write down the value of sin 30°

.... *0.5*

(Total for Question 30 is 1 mark)

TOTAL FOR PAPER IS 80 MARKS

Candidate surname		Other names

Centre Number | Candidate Number

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

Friday 19 May 2023

Morning (Time: 1 hour 30 minutes)

Paper reference **1MA1/1F**

Mathematics
PAPER 1 (Non-Calculator)
Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, 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 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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

Answer ALL questions.
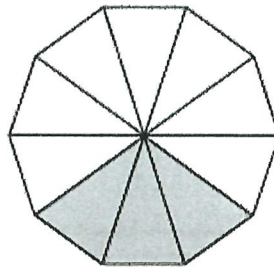
Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 38% as a decimal.

.... 0·38 ....

(Total for Question 1 is 1 mark)

2 What fraction of this shape is shaded?

$\dfrac{3}{10}$

....

(Total for Question 2 is 1 mark)

3 Here is a list of numbers.

1.6   1.4   2.1   0.5   1.3

From the list, write down the smallest number.

0·5, 1·3, 1·4, 1·6, 2·1

(Total for Question 3 is 1 mark)

4 Work out − 9 + 5

.... − 4 ....

(Total for Question 4 is 1 mark)

5 Solve $p - 2 = 3$

$+2\left(p = 5\right)+2$

$p =$ ....5................................

(Total for Question 5 is 1 mark)

---

6 Freddie adds labels to this diagram of a circle.

Diameter

Circumference

Centre
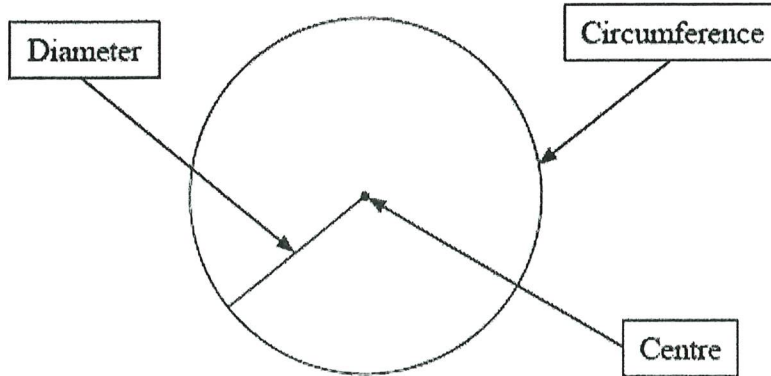
Explain why one of the labels is wrong.

The Diameter label should be Radius

(Total for Question 6 is 1 mark)

---

7   Write down **three** different factors of 20

1×20 4×5
2×10 ↖ Any of these will do.
~~4~~

........1........ , ...2........ , ...5........

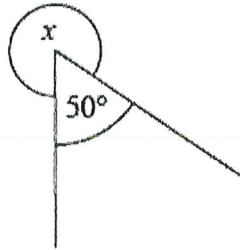**(Total for Question 7 is 2 marks)**

8

(a) Work out the size of the angle marked x.

$360 - 50 = 310$ (∠s about a point total 360)

........310........ °

(2)

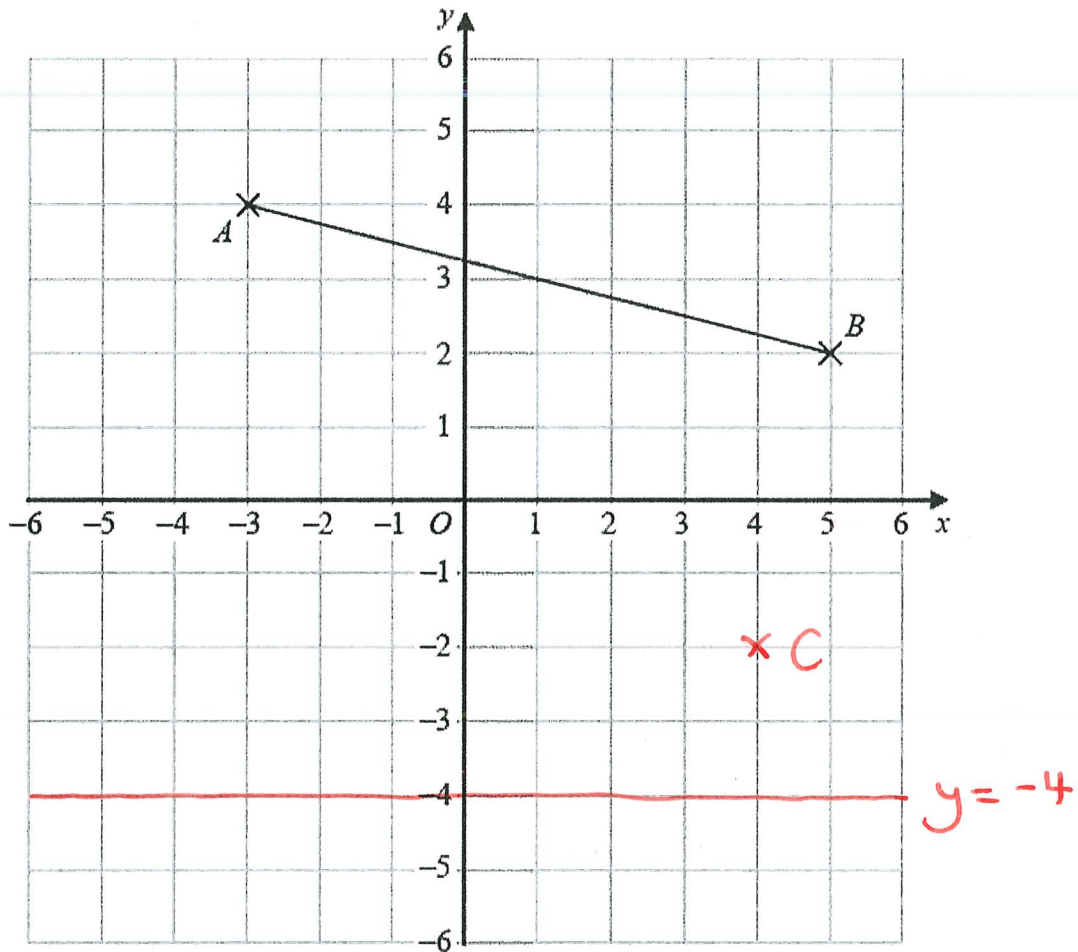A student says that an angle of 50° is an obtuse angle.

The student is wrong.

(b) Explain why.

~~Because he is an idiot.~~
$50° < 90°$. Angles $< 90°$ are acute angles

(1)

(Total for Question 8 is 3 marks)

9

(a) Write down the coordinates of point B.

(............5............ , ...2............)

(1)

(b) Plot the point with coordinates (4, –2)
   Label this point C.

(1)

(c) Write down the coordinates of the midpoint of AB.

(............1............ , ...3............)

$x: \dfrac{-3+5}{2} = \dfrac{2}{2} = 1 \quad y: \dfrac{4+2}{2} = 3$

(1)

(d) Draw the line with equation $y = -4$

(1)

(Total for Question 9 is 4 marks)

10 Max sees this special offer in a shop.

> Buy one large plate and get one small plate for half the normal price.

The normal price of a large plate is £2
The normal price of a small plate is 80p

Max wants to buy 6 large plates and 6 small plates using this offer.
He has £15

Has Max got enough money?
You must show how you get your answer.

$6 \times 2 = £12$

$80 \div 2 = 40$

$40 \times 6 = 240p$

$= £2.40$

$12 + 2.40 = 14.40$

Yes, Max has enough money.

(Total for Question 10 is 4 marks)

11 A total of 700 tickets were on sale for a football match.

452 of the tickets were sold.

(a) How many tickets were **not** sold?

$$\begin{array}{r} \overset{6}{\cancel{7}}\overset{9}{\cancel{0}}0 \\ -\ 452 \\ \hline 248 \end{array}$$

248 tickets

(2)

For a different football match,

297 tickets were sold for £9.50 each.
399 tickets were sold for £19.50 each.

(b) Work out an estimate for the total amount of money paid for these tickets.
You must show all your working.

$300 \times 10 = £3000$

$400 \times 20 = £8000$

$3000 + 8000 = £11,000$

£ _11,000_

(3)

(c) Is your answer to part (b) an underestimate or an overestimate?
Give a reason for your answer.

My answer is an overestimate because I rounded all the numbers up. The actual money paid would be less.

(1)

(Total for Question 11 is 6 marks)

12 Here are 6 numbers.

13   5   4   9   3   8

Work out the mean.

$$13 + 5 + 4 + 9 + 3 + 8 = 42$$

$$\frac{42}{6} = 7$$

.... 7 ....

(Total for Question 12 is 2 marks)

---

13 (a) Simplify $\dfrac{15a}{3}$

$$\frac{\cancel{15}^5 a}{\cancel{3}^1}$$

.... 5a ....

(1)

(b) Simplify $19 + 5b + 4c - 7b + c$

$$19 - 2b + 5c$$

Order doesn't matter.

.... $19 + 5c - 2b$ ....

(2)

sign does.

(c) Factorise $8d - 6$

$$2(4d - 3)$$

.... $2(4d - 3)$ ....

(1)

(Total for Question 13 is 4 marks)

14 Last week, 73% of the tickets sold at a cinema were adult tickets.

(a) What percentage of the tickets sold were **not** adult tickets?

$$100 - 73 = 27$$

.... 27 %

(1)

Some people watched a film at the cinema.

number of adults : number of children = 2 : 5

(b) What fraction of these people were adults?

$$\frac{2}{2+5} = \frac{2}{7}$$

(1)

On Friday,
　　500 people watched a film at the cinema.
　　70% of these people were children.
On Saturday,
　　720 people watched the film at the cinema.
　　$\frac{5}{8}$ of these people were children.

Kasim thinks more children watched the film on Friday than on Saturday.

(c) Is Kasim correct?
　　You must show how you get your answer.

Friday: $\frac{70}{100} \times \overset{5}{\cancel{500}} = 350$ children

Saturday: $\frac{5}{8} \times \overset{90}{\cancel{720}} = 450$ children

Kasim is wrong.

(3)

(Total for Question 14 is 5 marks)

15 Work out $\frac{6}{7} \times \frac{5}{12}$

Give your answer as a fraction in its simplest form.

$$\frac{\cancel{6}^{1}}{7} \times \frac{5}{\cancel{12}_{2}} = \frac{5}{14}$$

........................$\frac{5}{14}$........................

(Total for Question 15 is 2 marks)

16 Here is the list of ingredients for making 20 biscuits.

Ingredients for 20 biscuits
150 g butter
100 g sugar
250 g flour

Harry wants to make 60 biscuits.

How much flour does Harry need?

$$250 \times 3 = 750 \text{ g}$$

........................750........................ g

(Total for Question 16 is 2 marks)

17 There are 200 counters in a bag.

    38 counters are red.
    52 counters are blue.

The rest of the counters are yellow or green.
There are the same number of yellow counters as green counters.

What percentage of the counters in the bag are yellow?

$$38 + 52 = 90$$

$$200 - 90 = 110$$

$$\frac{110}{2} = 55$$

$$\frac{55}{200} = \frac{11}{40} = \frac{27\frac{1}{2}}{100}$$

....**27.5**......%

(Total for Question 17 is 4 marks)

---

18 Naomi has b bags of apples and c crates of apples.

There are 5 apples in each bag.
There are 28 apples in each crate.

Naomi has a total of T apples.

Write a formula for T in terms of b and c.

$$T = 5b + 28c$$

....$T = 5b + 28c$..

(Total for Question 18 is 3 marks)

---

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

$$-5 \qquad 3 \qquad 11 \qquad 19 \qquad 27$$

+8   +8

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

$$8n - 13$$

.......................$8n - 13$.......................

(Total for Question 19 is 2 marks)

---

20 Work out $8.46 \div 0.15$

$$8.46 \times 100 = 846$$
$$0.15 \times 100 = 15$$

$$15 \overline{)84\overset{9}{6}} = 56\,r\,6$$

$$56\tfrac{6}{15}$$

$$= 56\tfrac{2}{5}$$

1	15
2	30
3	45
4	60
5	75
6	90
7	105
8	120
9	135
10	150

.......................56.4.......................

(Total for Question 20 is 3 marks)

21 Work out $7\frac{3}{8} - 2\frac{1}{2}$

Give your answer as a mixed number.

$$7\frac{3}{8} - 2\frac{1}{2} = \frac{(7\times8)+3}{8} - \frac{(2\times2)+1}{2}$$

$$= \frac{59}{8} - \frac{5}{2}$$

$$= \frac{59}{8} - \frac{20}{8} = \frac{39}{8} = 4\frac{7}{8}$$

.... $4\frac{7}{8}$ ....

(Total for Question 21 is 3 marks)

---

22 A cube has a total surface area of 150 cm²

Work out the volume of the cube. — 6 faces on a cube

$$150 \div 6 = 25$$

$$\sqrt{25} = 5$$

$$5^3 = 125 \text{ cm}^3$$

.... 125 .... cm³

(Total for Question 22 is 4 marks)

23 The table shows information about the daily rainfall in a town for 60 days.

Rainfall (R mm)	Frequency	midpoint
$0 \le R < 5$	8	$2\frac{1}{2}$
$5 \le R < 10$	24	$7\frac{1}{2}$
$10 \le R < 15$	13	$12\frac{1}{2}$
$15 \le R < 20$	11	$17\frac{1}{2}$
$20 \le R < 25$	4	$22\frac{1}{2}$

Draw a frequency polygon for this information.

Use a ruler
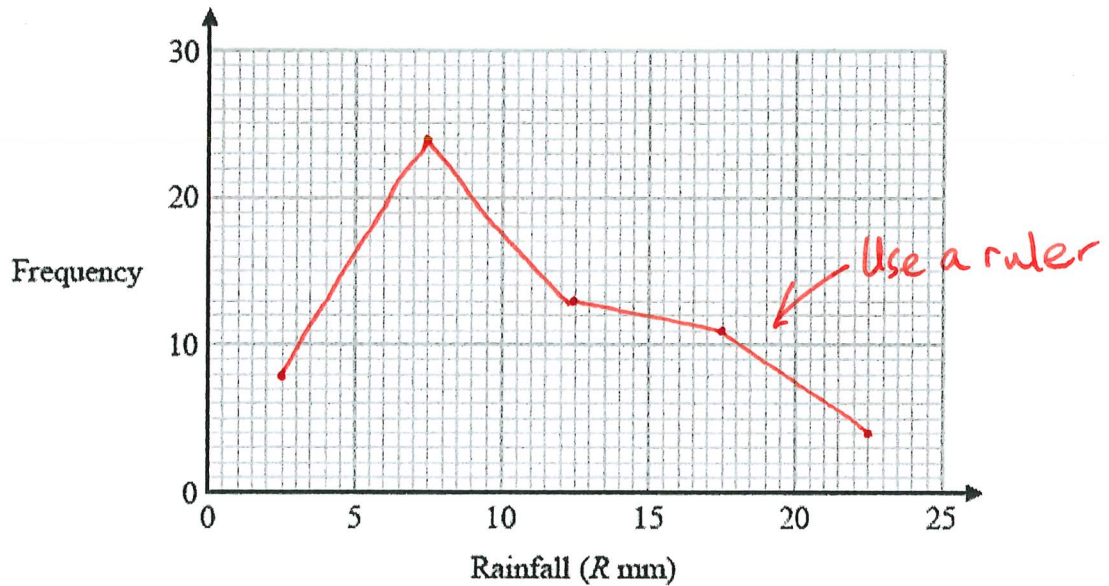
(Total for Question 23 is 2 marks)

24 $\mathscr{E}$ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
    A = {odd numbers} 1 3 5 7 9
    B = {square numbers} 1 4 9

(a) Complete the Venn diagram for this information.
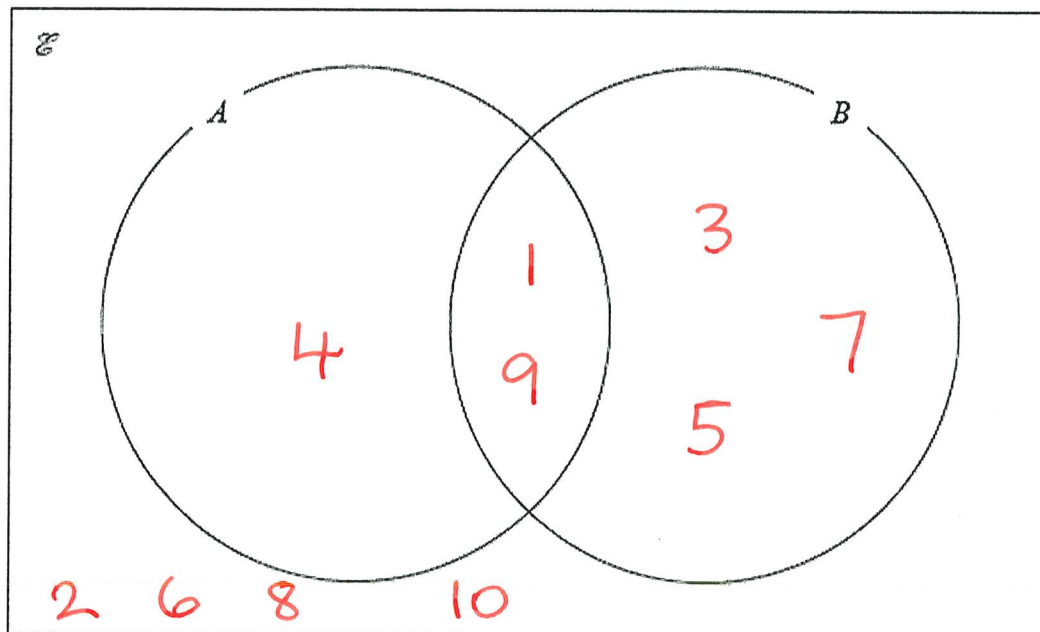
(3)

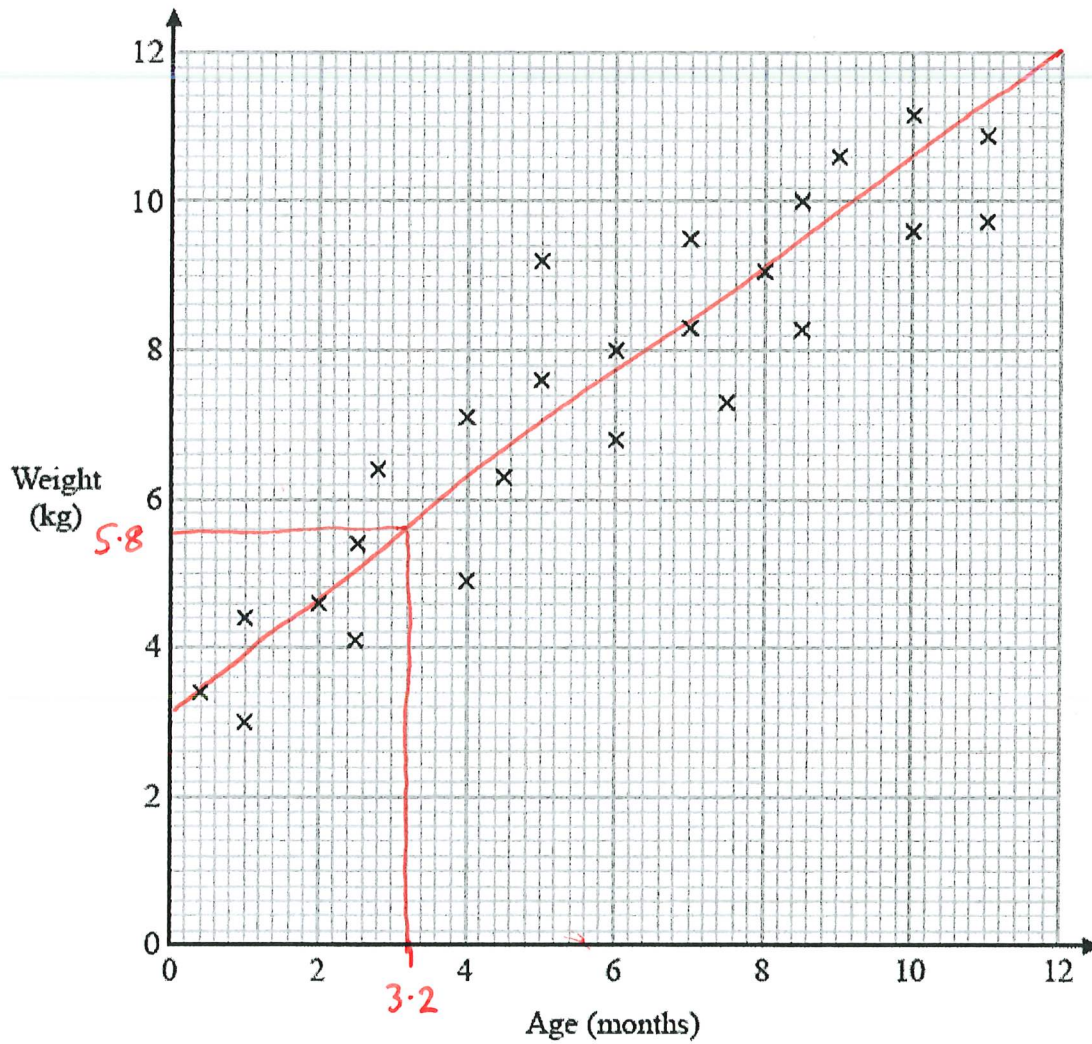A number is chosen at random from the universal set $\mathscr{E}$

(b) Find the probability that this number is in the set B'

$$\frac{5}{10} = \frac{1}{2}$$

(2)

(Total for Question 24 is 5 marks)

25 The scatter graph shows information about the ages and weights of some babies.

(a) Describe the relationship between the age and the weight of the babies.

There is a positive correlation between Age and Weight

(1)

Another baby has a weight of 5.8 kg

(b) Using the scatter graph, find an estimate for the age of this baby.

3.2 .... months
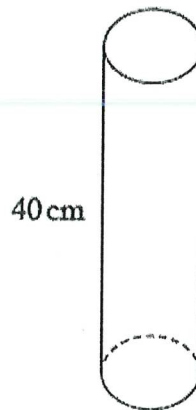
(2)

(Total for Question 25 is 3 marks)

26 The price of a holiday increases by 20%
This 20% increase adds £240 to the price of the holiday.

Work out the price of the holiday before the increase.

$$20\% = 240$$

×5

$$100\% = 1200$$

×5

£ ......1200......

(Total for Question 26 is 2 marks)

27   The diagram shows a solid cylinder on a horizontal floor.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

40 cm

The cylinder has a

>   volume of 1200 cm³
>   height of 40 cm.
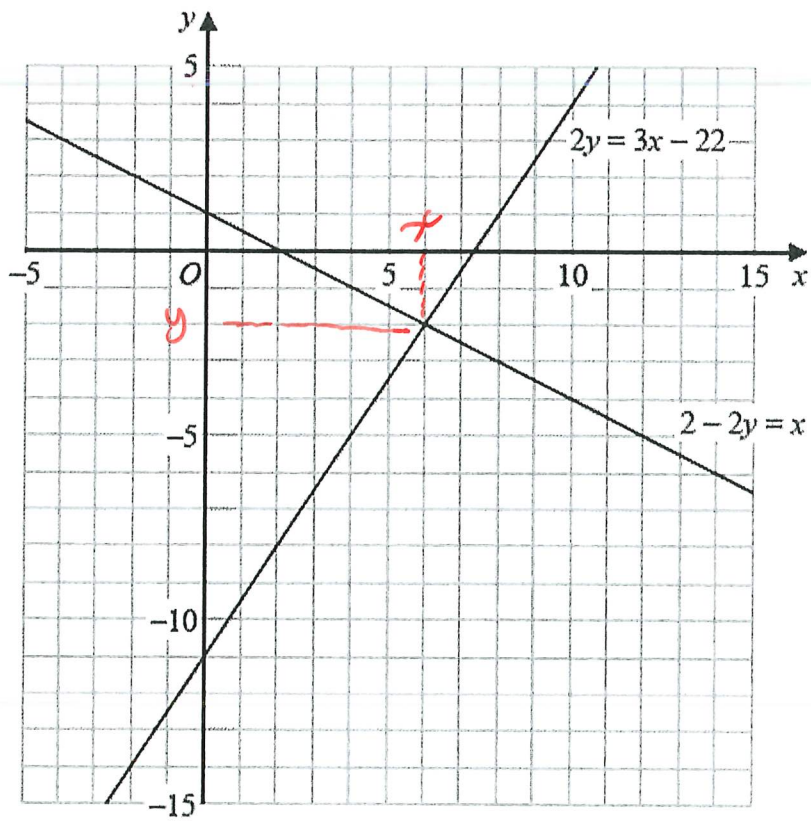
The cylinder exerts a force of 90 newtons on the floor.

Work out the pressure on the floor due to the cylinder.

$$P = \frac{f}{a}$$

$$a = \frac{V}{h}$$

$$= \frac{1200}{40}$$

$$= \frac{90}{30}$$

$$= 30$$

$$= 3$$

3

.... newtons/cm²

(Total for Question 27 is 3 marks)

28

Use these graphs to solve the simultaneous equations

$$2 - 2y = x$$
$$2y = 3x - 22$$

x = ...**6**..........

y = ...**−2**..........

(Total for Question 28 is 1 mark)

29 Work out the value of $\dfrac{4^{-6} \times 4^{9}}{4}$
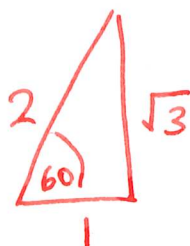
$$\frac{4^{-6+9}}{4^{1}} = \frac{4^{3}}{4^{1}} = 4^{2} = 16$$

16

....

(Total for Question 29 is 2 marks)

30 Write down the exact value of cos 60°

½

....

(Total for Question 30 is 1 mark)

31   The probability tree diagram shows the probabilities that Shayla will work at home or will work at the office on two days next week.

Monday   Friday

home

0.7   home

0.2

0.3   office

0.8

office

0.7   home

0.2×0.3

$= 0.06$
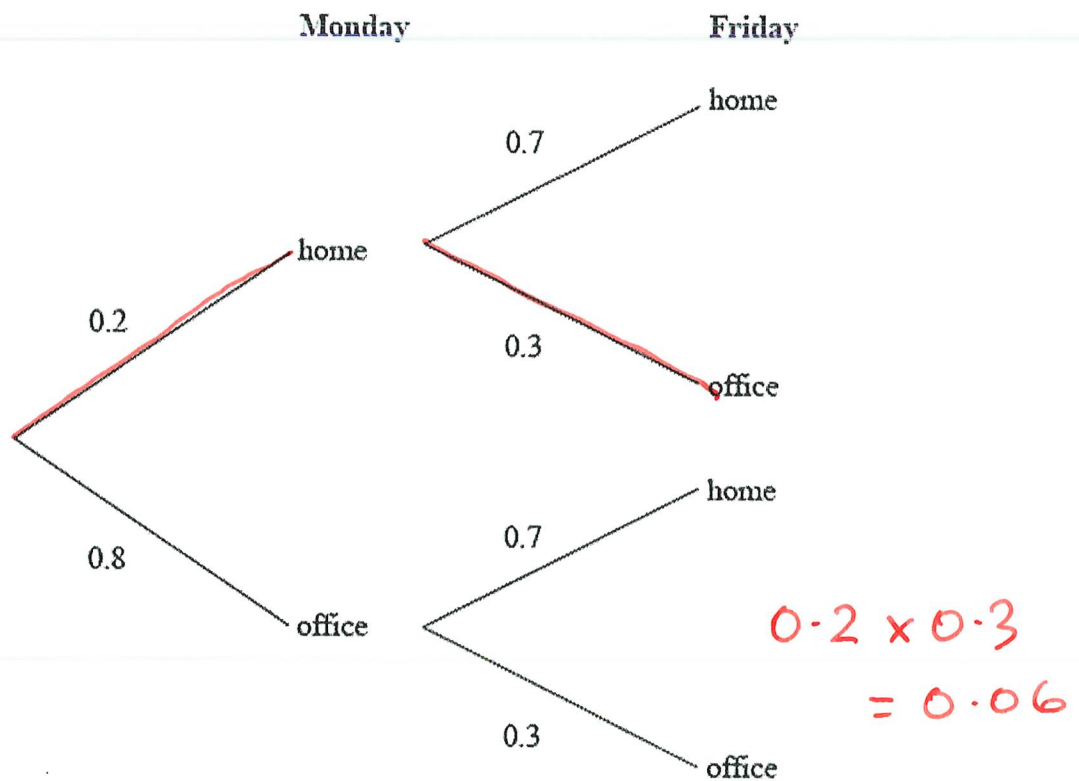
0.3   office

Work out the probability that Shayla will work at home on Monday and work at the office on Friday.

0.06

(Total for Question 31 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS