Write your name here

Surname		Other names

PEARSON EDEXCEL
Level 1/Level 2 GCSE (9 - 1)

Centre Number

Candidate Number

Mathematics

Paper 1 (Non-Calculator)

Model Solutions

Foundation Tier

Sample Assessment Materials – Issue 2
Time: 1 hour 30 minutes

Paper Reference
1MA1/1F

Total Marks

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

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.*
  Calculators may not be used.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out**.

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 ►

S48571A

S48571A0120

PEARSON

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

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

| | 0.61 | 0.1 | 0.16 | 0.106 |

0.1, 0.106, 0.16, 0.61

(Total for Question 1 is 1 mark)

2   Write 0.037 as a fraction.

$\dfrac{0.037}{1} \xrightarrow{\times 1000} = \dfrac{37}{1000}$

$\times 1000$

$\dfrac{37}{1000}$

(Total for Question 2 is 1 mark)

3   Write down the 20th odd number.

1, 3, 5, 7 and on and on
The sequence for odd numbers is $2n-1$
So $2(20)-1$ is 20th odd number.
$= 40-1 = \underline{\underline{39}}$

39

(Total for Question 3 is 1 mark)

4   Write down all the factors of 20

$1 \times 20 = 20$
$2 \times 10 = 20$ So factors are $\underline{1,2,4,5,10,20}$
$4 \times 5 = 20$

$1,2,4,5,10,20$

(Total for Question 4 is 2 marks)

5   Tanya needs to buy chocolate bars for all the children in Year 7
Each of the 130 children get one chocolate bar.

There are 8 chocolate bars in each packet.

Work out the least number of packets of chocolate bars that Tanya needs to buy.

$1 \times 130 = 130$ chocolates

$\dfrac{130}{8} \rightarrow 8\overline{)130.00}^{016.25} = 16.25$

So 17 packets needed as Greg can only buy a whole number of packets.

17

(Total for Question 5 is 3 marks)

6   Greg rolls a fair ordinary dice once.

(i) On the probability scale, mark with a cross (×) the probability that the dice will land
on an odd number.   ①, 2, ③, 4, ⑤, 6 → 3/6 are odd = 1/2

```
|-------|-------|-------|---X---|-------|-------|
0                      1/2                      1
```
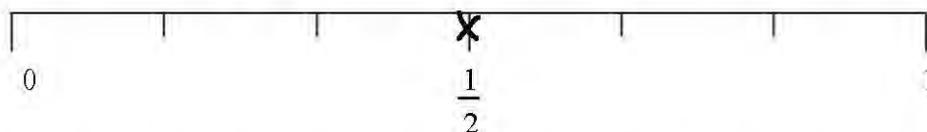
(ii) On the probability scale, mark with a cross (×) the probability that the dice will land
on a number less than 5   1, 2, 3, 4, 5, 6 → $\dfrac{4}{6}$ numbers less than 5.

```
|-------|-------|-------|-------X-------|-------|
0      1/6     2/6    1/2=3/6  4/6    5/6   1=6/6
```
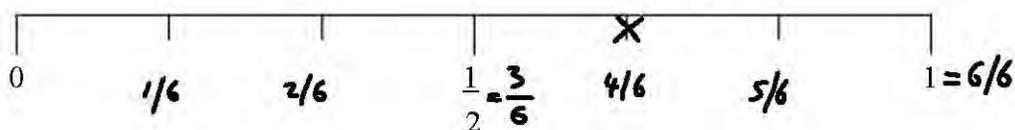
(Total for Question 6 is 2 marks)

7   One day Sally earned £60
    She worked for 8 hours.

    Work out Sally's hourly rate of pay.

$$\frac{£60}{8} = \frac{60}{8} = \frac{30}{4} = \frac{15}{2} = £7.5 \text{ per hour}$$

£ __7.50__

(Total for Question 7 is 2 marks)

8   Work out 15% of 80

$\div 10 \left(\begin{array}{l} 100\% = 80 \\ 10\% = 8 \\ 5\% = 4 \end{array} \right) \div 10$
$\div 2 \quad \div 2$

$$10\% + 5\% = 15\%$$
$$8 + 4 = 12$$

12

(Total for Question 8 is 2 marks)

9   There are 3 red beads and 1 blue bead in a jar.
    A bead is taken at random from the jar.

    What is the probability that the bead is blue?

    $3 + 1 = 4$ total beads.

    1 is blue so $\frac{1}{4}$.

1/4

(Total for Question 9 is 1 mark)

10 There are only black pens and green pens in a box.
    The ratio of the number of black pens in the box to the number of green pens in the box
    is 2 : 5

    What fraction of the pens are black?

    Total parts → $2 + 5 = 7$

    2 parts are black → $\frac{2}{7}$

2/7

(Total for Question 10 is 1 mark)

11 Sally has three tiles.
Each tile has a different number on it.
Sally puts the three tiles down to make a number.
Each number is made with all three tiles.

How many different numbers can Sally make?

$\boxed{1}\ \boxed{2}\ \boxed{3}$

$\boxed{?}\quad\boxed{?}\quad\boxed{?}$

can be any of 3 cards

can only be one of 2 remaining cards

I can only be last card available

3 × 2 × 1 = 6

(Total for Question 11 is 2 marks)

12 Here are the first three patterns in a sequence.
The patterns are made from triangles and rectangles.
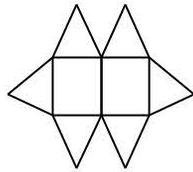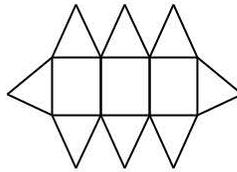
| pattern number | pattern number 2 | pattern number 3 |
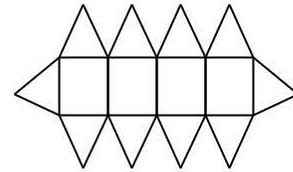
(a) How many triangles are there in pattern number 7?

$6, 8, 10$

$+2 \quad +2$ → Sequence is going up in 2 so $\underline{2n}$.
number before 6 would be 4 so $\underline{2n+4}$.

$2n+4 → 2(7)+4 = \underline{\underline{18}}$

18

(2)

Charlie says

"There are 4 rectangles in pattern number 3 so there will be 8 rectangles in pattern number 6"

(b) Is Charlie right?
Give a reason for your answer.

The pattern for the rectangles is pattern number + 1.
So for 8th pattern → $8+1 = 9$ rectangles.
So Charlie is incorrect.

(1)

(Total for Question 12 is 3 marks)

13 Paul organised an event for a charity.

Each ticket for the event cost £19.95
Paul sold 395 tickets.

Paul paid costs of £6000
He gave all money left to the charity.

(a) Work out an estimate for the amount of money Paul gave to the charity.

Money made from tickets → £19.95 × 395
→ £20.00 × 400 = £8000

Costs £6000
So money to charity → £8000 − £6000 = £2000

£ **2000**

(3)

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

Overestimate as both numbers rounded up and then multiplied.

(1)

(Total for Question 13 is 4 marks)

14 The table shows information about the numbers of fruit trees in an orchard.

Apple tree	Pear tree	Plum tree
45	20	25

(a) The pictogram shows this information.

Complete the key for the pictogram.

Use plum tree to work out.

$5\triangle = 25 \rightarrow \dfrac{25}{5} = \triangle = \underline{\underline{5}}$
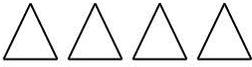
Apple tree	△ △ △ △ △ △ △ △ △
Pear tree	△ △ △ △
Plum tree	△ △ △ △ △
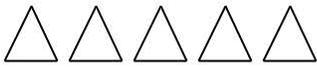
Key: △ represents ...5... trees

(1)

(b) There are 90 fruit trees in the orchard.

Apple tree	Pear tree	Plum tree
45	20	25

Draw an accurate pie chart for this information.

Pear trees $\rightarrow \dfrac{20}{90} = \dfrac{2}{9}$

$\dfrac{2}{9} \times \dfrac{360}{1} = \dfrac{720}{9} = 80°$

Apple trees $\rightarrow \dfrac{45}{90} = 1/2$

$1/2 \times 360° = 180°$

Plum trees

Apple trees

100° 180°

80°

Pear trees
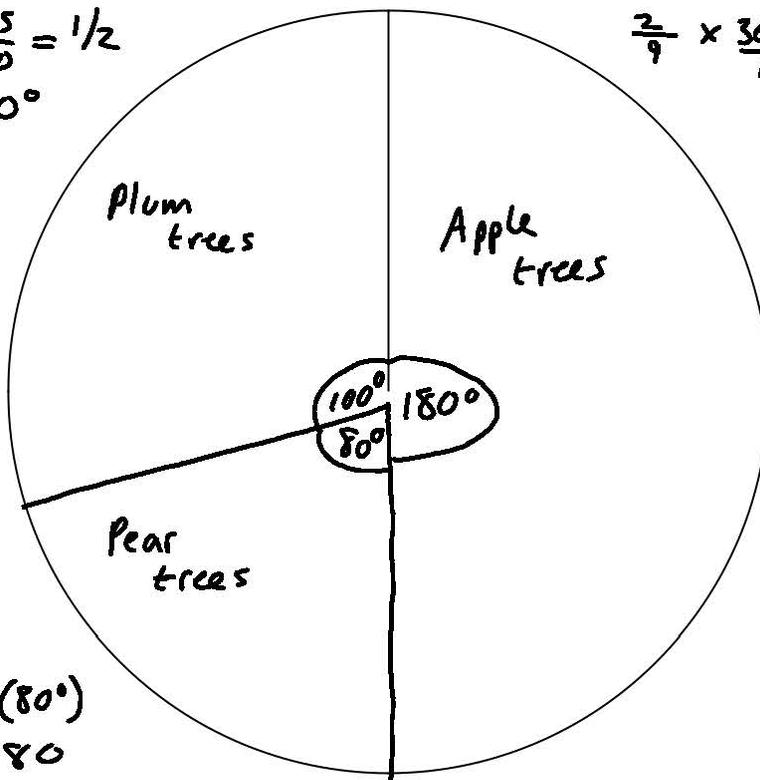
Plum tree
↓
$360° - (180°) + (80°)$
$= 180 - 80$
$= 100°$

(3)

(Total for Question 14 is 4 marks)

15 Carpet tiles are going to be used to cover a floor.

The floor is a 1200mm by 1000mm rectangle.
Each carpet tile is a 40cm by 30cm rectangle.

Exactly 10 carpet tiles can be used to cover the floor completely.

Show in a labelled sketch how this can be done.

1200 mm = 120 cm   1000 mm = 100cm
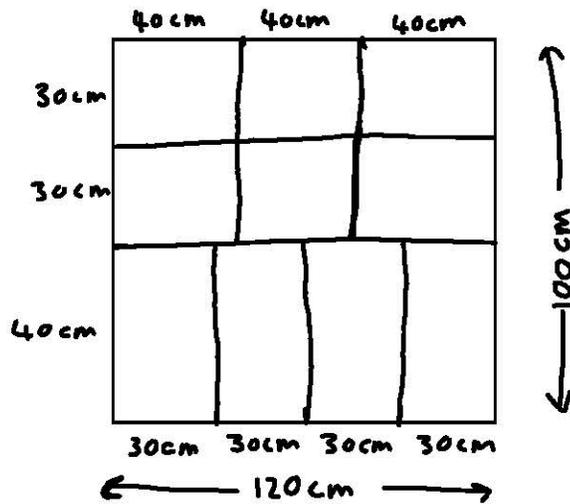
**(Total for Question 15 is 3 marks)**

16 Sam buys 20 boxes of oranges.
There are 25 oranges in each box.

Each boxes of oranges costs £7

Sam sells 2/5 of the oranges he bought.
He sells each of these oranges for 40p.

He then sells each of the remaining oranges at 3 oranges for 50p.

Did Sam make a profit or did Sam make a loss?
You must show working to justify your answer.

Total Oranges bought → 20 × 25 = 500

Money spent → 20 × £7 = £140

Sold 2/5 of 500 oranges → 200

200 × £0.40 = £80 made.

Remaining 300 oranges sold in 3's → $\frac{300}{3}$ = 100 batches

100 × £0.50 = £50 made.

Total made → £80 + £50 = £130

Money spent → £140

Profit → made − spent → £130 − £140 = −£10

Negative answer so Sam made loss of £10.

(Total for Question 16 is 5 marks)

17 100 students had some homework.

42 of these students are boys.
8 of the 100 students did **not** do their homework.
53 of the girls did do their homework.

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

(3)

did do homework — 39

42 − 3 = 39

42

boys

100

did **not** do homework — 3

8 − 5 girls = 3

did do homework — 53

girls

58

100 − 42 = 58

did **not** do homework — 5

58 − 53 = 5
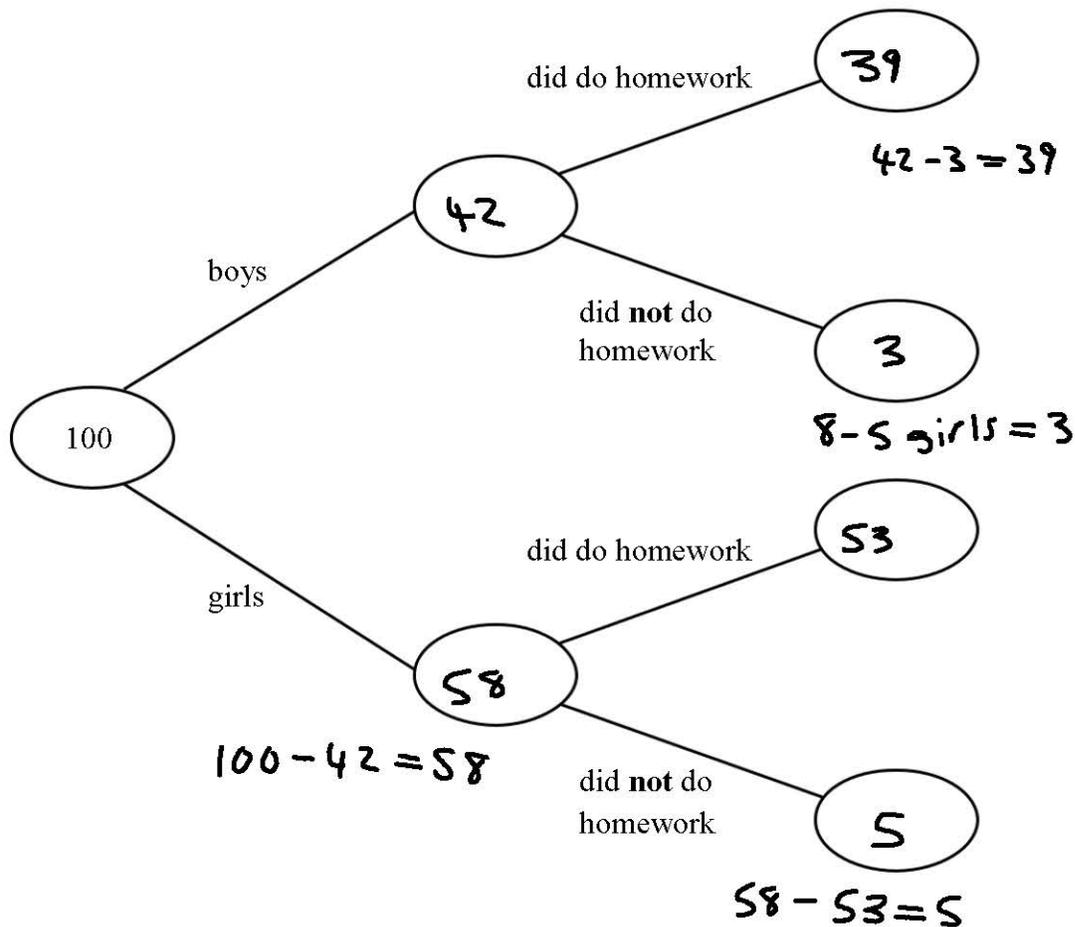
One of the girls is chosen at random.

(b) Work out the probability that this girl did **not** do her homework.

5 girls out of 58 didn't

5/58

5/58

(2)

(Total for Question 17 is 5 marks)

18 (a) Work out $2/7 + 1/5$

$5 \times 7 = 35$ which is LCM so use as common denominator.

$\frac{2}{7} \xrightarrow{\times 5} = \frac{10}{35}$ $\frac{1}{5} \xrightarrow{\times 7} = \frac{7}{35}$ $\frac{10}{35} + \frac{7}{35} = \frac{17}{35}$

$\times 5$ $\times 7$

$\dfrac{17}{35}$

(2)

(b) Work out $1\ 2/3 \div 3/4$

$1\frac{2}{3} \div \frac{3}{4}$

$1\frac{2}{3} \rightarrow \frac{3}{3} + \frac{2}{3} = \frac{5}{3}$

$\frac{5}{3} \div \frac{3}{4} \rightarrow \frac{5}{3} \times \frac{4}{3} = \frac{20}{9}$

$\dfrac{20}{9}$

(2)

(Total for Question 18 is 4 marks)

19 Solve $4x + 5 = x + 26$

$4x + 5 = x + 26$

$3x + 5 = 26$

$3x = 21$

$x = 7$

$x = 7$

(Total for Question 19 is 2 marks)

20 In a sale, normal prices are reduced by 20%.

The normal price of a coat is reduced by £15

Work out the normal price of the coat.

$\div 2 \left\{ \begin{array}{l} £15 = 20\% \\ £7.50 = 10\% \end{array} \right\} \div 2$

$\times 10 \left\{ \begin{array}{l} £7.50 = 10\% \\ £75 = 100\% \end{array} \right\} \times 10$

£ _____ 75 _____

(Total for Question 20 is 2 marks)

21 Work out 6.34×5.2

$$\begin{array}{r} \times\ 6.340 \\ 5.200 \\ \hline 0.008 \\ 0.060 \\ 1.200 \\ 0.200 \\ 1.500 \\ 30.000 \\ \hline 32.968 \\ \hline\hline \end{array}$$

32.968

(Total for Question 21 is 3 marks)

22 Expand and simplify $(m + 7)(m + 3)$

$(m+7)(m+3)$

$m^2 + 7m + 3m + 21$

$m^2 + 10m + 21$

$m^2 + 10m + 21$

(Total for Question 22 is 2 marks)

23
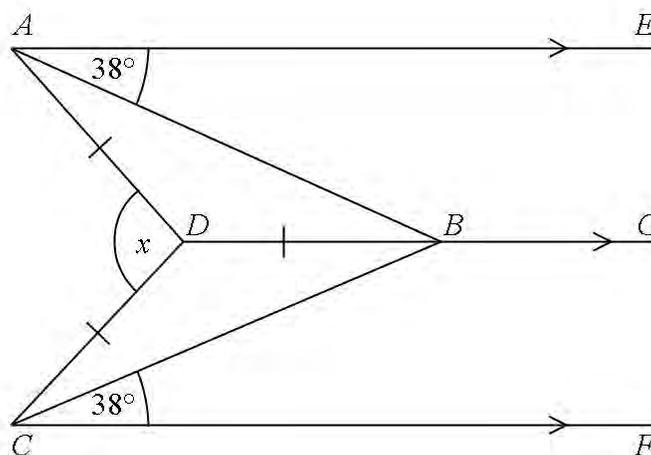
AE, DBG and *CF* are parallel.
DA=DB=DC.
Angle *EAB* = angle *BCF* = 38°

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

$\angle ABD = 38°$ and $\angle CBD = 38°$ because alternate angles equal

$\angle DAB = 38°$ and $\angle DCB = 38°$ because base angles equal in isocelles.

$\angle ADB = \angle CDB = 180 - 2(38)$
$= 180 - 76$
$= 104°$

Angles around a point add to 360°.

$x = 360 - 2(104)$
$= 360 - 208$
$= \underline{152°}$

152 °

(Total for Question 23 is 3 marks)

24 Gary drove from London to Sheffield.
It took him 3 hours at an average speed of 80km/h.

Lyn drove from London to Sheffield.
She took 5 hours.

Assuming that Lyn
        drove along the same roads as Gary
    and did not take a break,
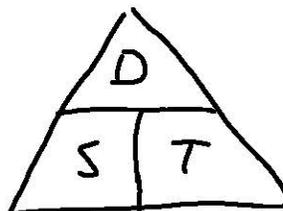
(a) work out Lyn's average speed from London to Sheffield.

$Speed = \dfrac{distance}{time}$ $Distance = speed \times time$

$Gary\ distance \rightarrow 80 \times 3 = 240\ km$

$Lyn\ speed \rightarrow \dfrac{240}{5} = \underline{\underline{48\ km/h}}$

....................**48**.................... km/h

(3)

(b) If Lyn did **not** drive along the same roads as Gary, explain how this could affect your
answer to part (a).

It means she would had travelled a different
distance to Gary so her average speed would be different.

(1)

(Total for Question 24 is 4 marks)

25 In a company, the ratio of the number of men to the number of women is 3:2

40% of the men are under the age of 25
10% of the women are under the age of 25

What percentage of all the people in the company are under the age of 25?

Total parts = 2 + 3 = 5

40% of men → $0.4 \times 3 = 1.2$ → $1.2 + 0.2 = 1.4$

10% of women → $0.1 \times 2 = 0.2$

$$\frac{1.4}{5} = \frac{14}{50} = \frac{28}{100} = 28\%$$

28 %

(Total for Question 25 is 4 marks)

26 The plan, front elevation and side elevation of a solid prism are drawn on a centimetre grid.

plan

front elevation   side elevation
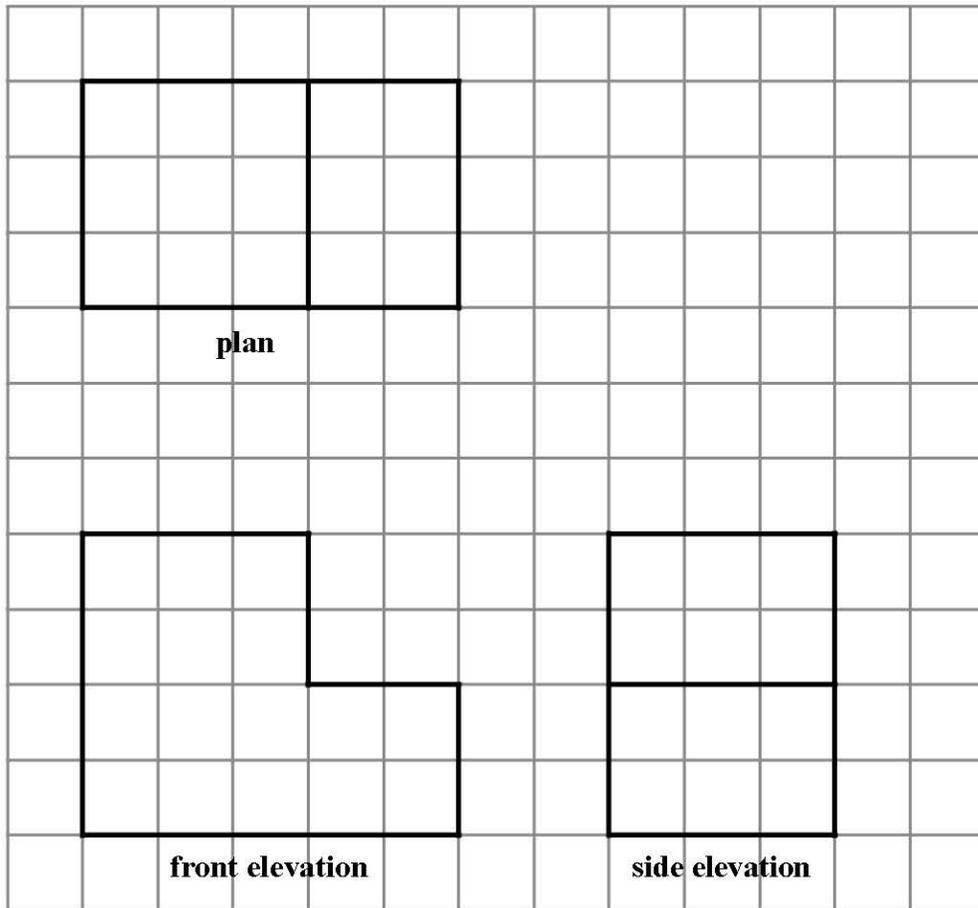
In the space below, draw a sketch of the solid prism.
Write the dimensions of the prism on your sketch.
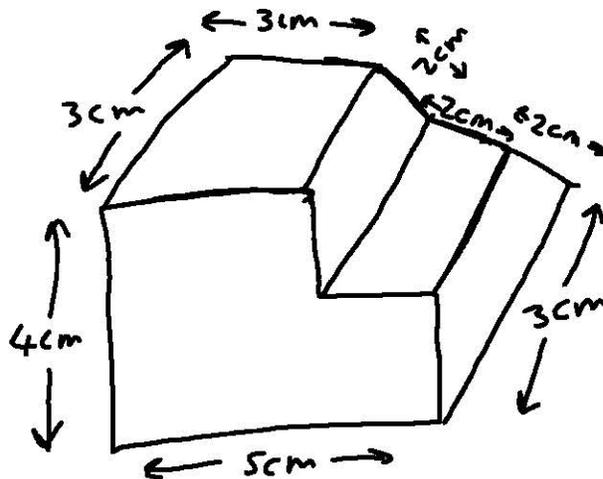
(Total for Question 26 is 2 marks)

27 There are 1200 students at a school.

Kate is helping to organise a party.
She is going to order pizza.

Kate takes a sample of 60 of the students at the school.
She asks each student to tell her **one** type of pizza they want.

The table shows information about her results.

Pizza	Number of students
ham	20
salami	15
vegetarian	8
margarita	17

Work out how much ham pizza Kate should order.
Write down any assumption you make **and** explain how this could affect your answer.

$\frac{20}{60}$ wanted ham pizza = 1/3

1/3 × 1200 = 400 ham pizzas

I assumed the sample is representative of the whole population.

(Total for Question 27 is 3 marks)

28 Here is a parallelogram.
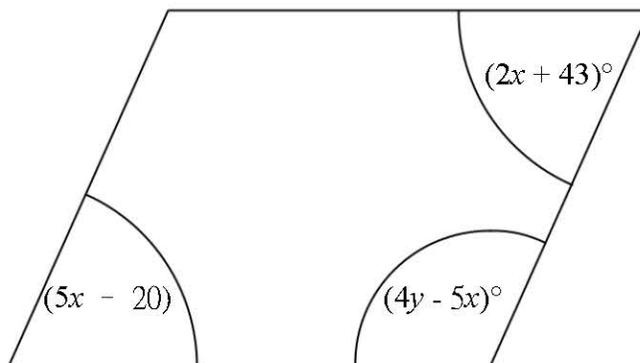
Work out the value of x and the value of y.

$5x - 20 = 2x + 43$ because opposite angles of parallelogram equal.

$3x = 63$

$\underline{\underline{x = 21}}$

Angles on same side add to $180°$

$(5x - 20) + (4y - 5x) = 180°$

$(105 - 20) + (4y - 105) = 180°$

$85 + 4y - 105 = 180$

$4y = 200$

$\underline{\underline{y = 50°}}$

$x = \quad 21°$

$y = \quad 50°$

(Total for Question 28 is 5 marks)

29
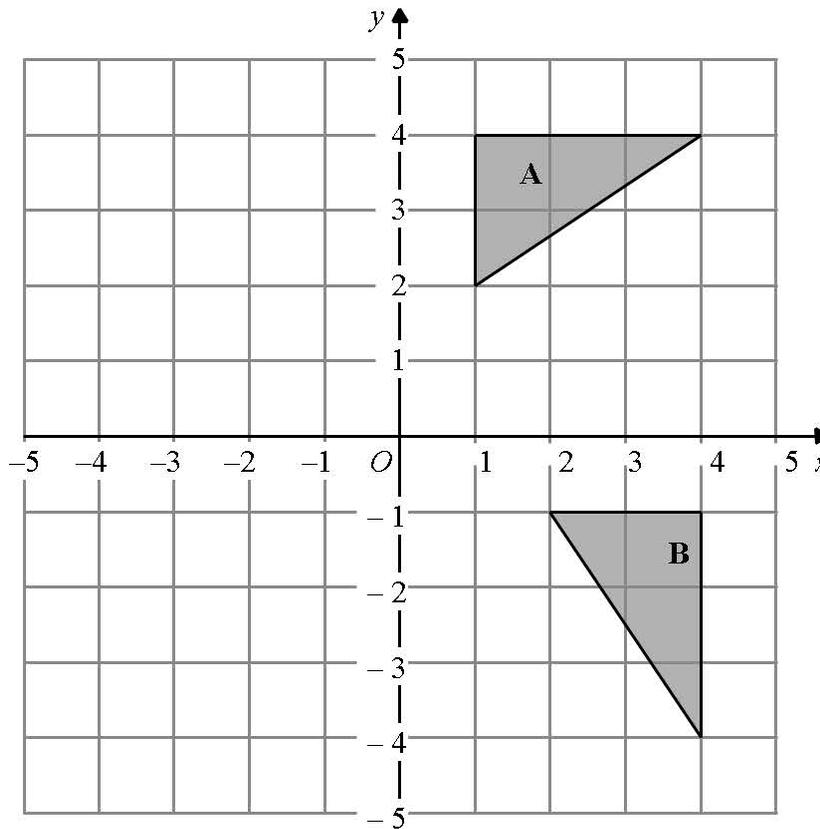
Describe fully the single transformation that maps triangle **A** onto triangle **B**.

Rotation 90° clockwise about (0,0)

....

(Total for Question 29 is 2 marks)

30 $a = \begin{pmatrix} 3 \\ -7 \end{pmatrix}$ $b = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$

Work out **b − 2a** as a column vector.

$$\begin{pmatrix} 4 \\ 2 \end{pmatrix} - 2 \begin{pmatrix} 3 \\ -7 \end{pmatrix} = \begin{pmatrix} 4 \\ 2 \end{pmatrix} - \begin{pmatrix} 6 \\ -14 \end{pmatrix} = \begin{pmatrix} -2 \\ 16 \end{pmatrix}$$

$$\begin{pmatrix} -2 \\ 16 \end{pmatrix}$$

(Total for Question 30 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS