Mathematics
2019 Paper 1 (Non-Calculator)
Foundation Tier

Time: 1 hour 30 minutes

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

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.
- **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.

1 Simplify $x^2 + x^2$

$$2x^2$$

(Total for question 1 is 1 mark)

2 Write 0.4 as a percentage

$$40$$ %

(Total for question 2 is 1 mark)

3 Write 5661 to the nearest 1000

$$6000$$

(Total for question 3 is 1 mark)

4 Write $\frac{1}{4}$ as a decimal

$$0.25$$

(Total for question 4 is 1 mark)

5 Change 2.5 kilograms into grams

$$2500$$ grams

(Total for question 5 is 1 mark)

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

$$5.02 \qquad 5.1 \qquad 5.16 \qquad 5.152$$

5.02, 5.1, 5.152, 5.16

7 (a) Work out $15 - 6 \times 2$

$15 - 12$

3

(1)

(b) Work out the cube root of 27

3

(1)

8 There are only 15 beads in a bag.

There are   6 blue beads
2 red beads
7 green beads

A bead is picked at random from the bag

(a) Write down the probability the bead is red

$\frac{2}{15}$

(1)

(b) Write down the probability the bead is white

0

(1)

9 Here are the first 5 terms of a sequence.

14   17   20   23   26

(a) Find the next term of this sequence.

_____29_____
(1)

(b) Work out the 10th term of this sequence.

$3n + 11$
$30 + 11$

_____41_____
(1)

(Total for question 9 is 2 marks)

10 $a = 5$
         $b = 4$

Work out the value of $3a + 5b$

$3 \times 5 \quad + \quad 5 \times 4$
$15 \quad + \quad 20$

_____35_____

(Total for question 10 is 2 marks)

11   Find 21% of £160

$10\% = £16$
$20\% = £32$
$1\% = £1.60$

$21\% = £32 + £1.60$
$= £33.60$

_____£33.60_____

(Total for question 11 is 2 marks)

12
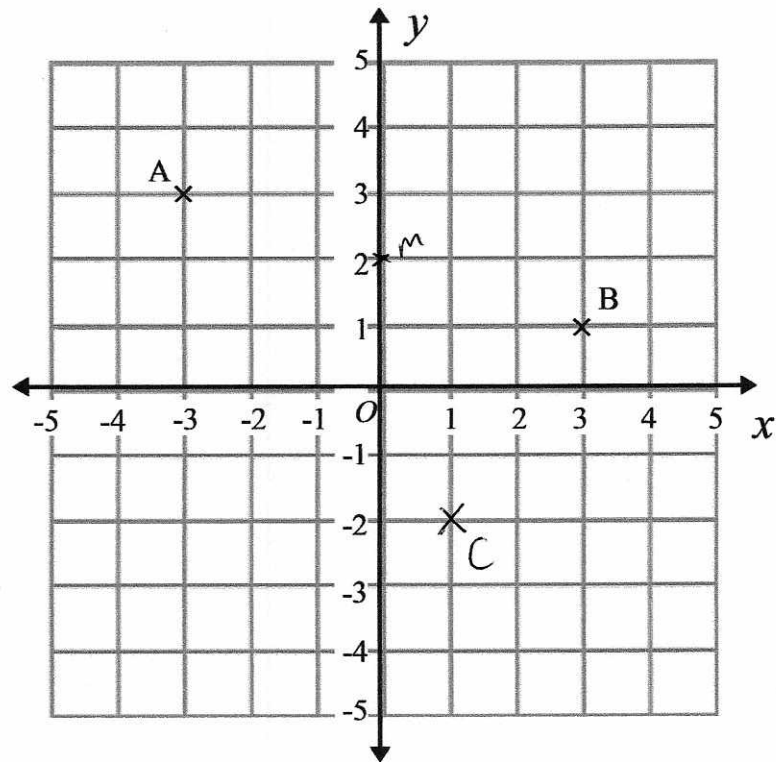
(a) On the grid mark with a cross (✗) the point (1,−2).
Label the point C.

(1)

(b) Write down the coordinates of point A.

(...−3... , ...3...)
(1)

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

(...0... , ...2...)
(1)

(Total for question 12 is 3 marks)

13 Mo goes to a Cafe.
He buys

2 coffees for £1.80 each
3 teas for £1.50 each
2 cakes for £2.10 each

Work out the total amount that Mo spends.

$$2 \times 1.80 = 3.60$$
$$3 \times 1.50 = 4.50$$
$$2 \times 2.10 = 4.20$$
$$12.30$$

£ 12.30

(Total for question 13 is 2 marks)

14 A map has the scale of 1 : 50000

The distance between two points on the map is 10 cm.

Work out the real distance between the two points. Give your answer in kilometres.

$$10 \times 50000$$

$$500\ 000 \ cm$$

$$5000 \ m$$

$$5 \ km$$

5 km

(Total for question 14 is 3 marks)

15 Work out 42×316

$$
\begin{array}{r}
3\,1 \cdot 6 \\
\times \quad 4\,2 \\
\hline
6\,3\,2 \\
1\,2\,6\,4\,0 \\
\hline
1\,3\,2\,7\,2 \\
\end{array}
$$

.............13272..............

16 In a bag there are blue sweets, red sweets and yellow sweets.

The number of red sweets is three times the number of blue sweets.
The number of yellow sweets is half the number of red sweets.

Write down the ratio of blue sweets to red sweets to yellow sweets.
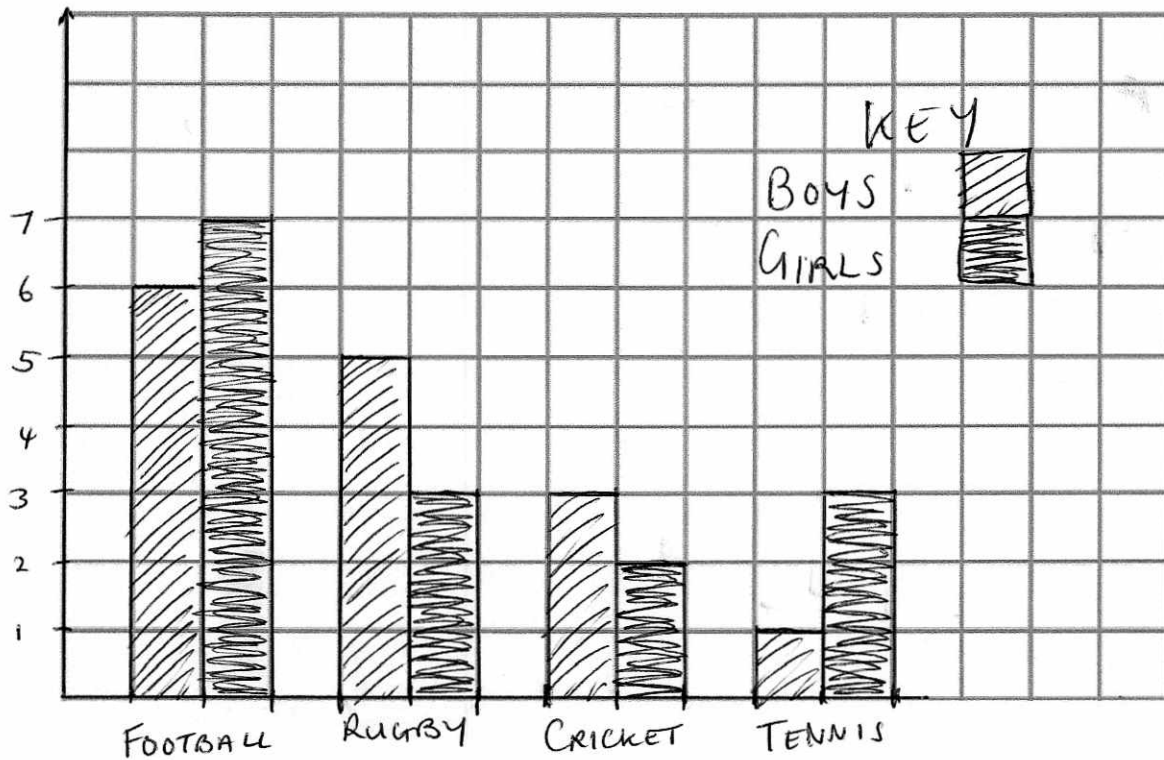Give your answer in the form $a:b:c$ where a, b and c are whole numbers

$$B : R : Y$$
$$1 : 3 : 1.5$$
$$2 : 6 : 3$$

17 The table below gives some information about the favourite sport of 30 students

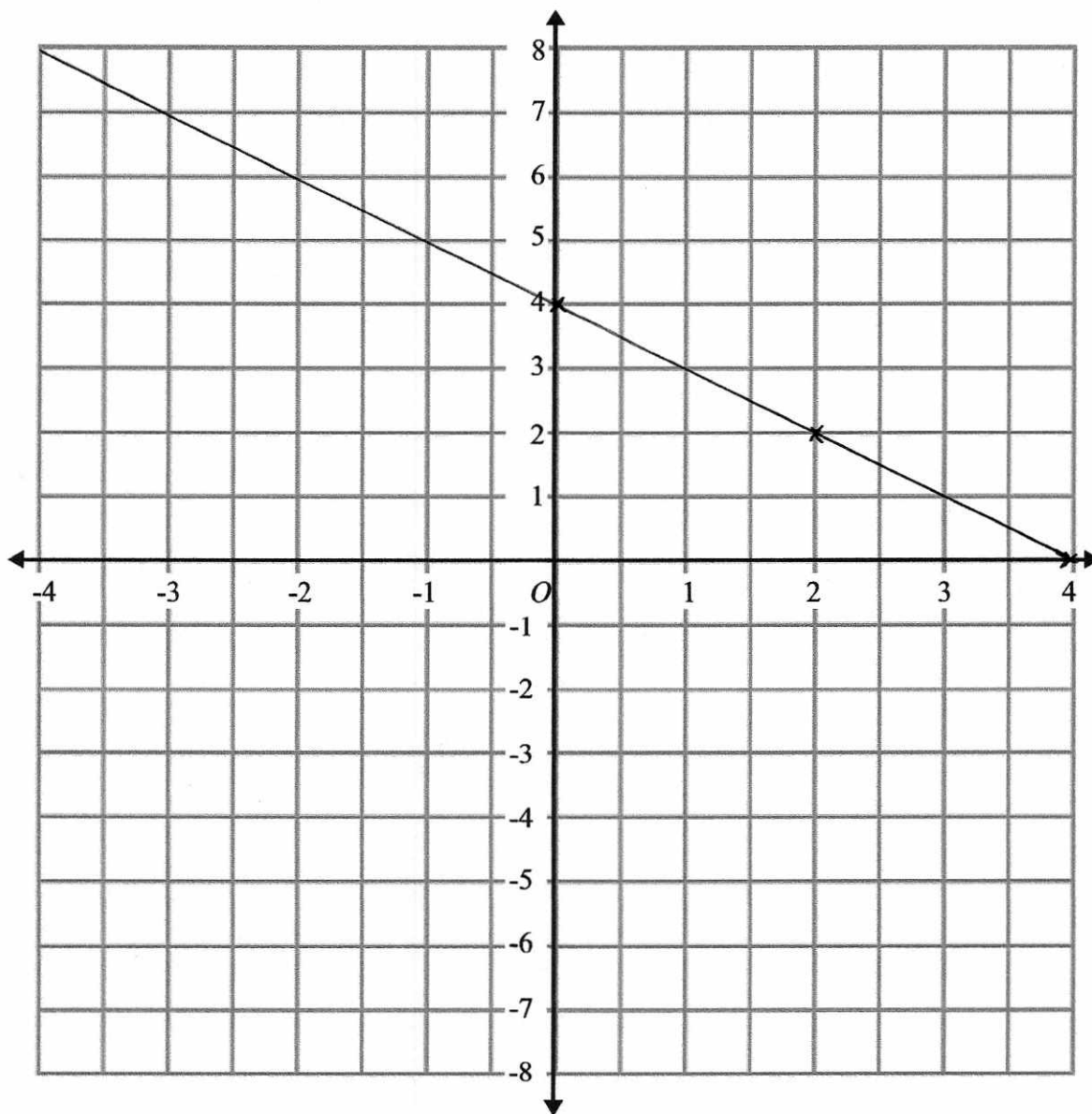| Sport	Number of boys	Number of girls
Football	6	7
Rugby	5	3
Cricket	3	2
Tennis	1	3

On the grid below, draw a suitable diagram to show this information

18 On the grid, draw the graph of $x + y = 4$ for x values from -4 to 4

x	0	2	4
y	4	2	0

(Total for question 18 is 3 marks)

19 Three packs of tea bags are available in the supermarket

Pack A	Pack B	Pack C
240 tea bags for £5	200 tea bags for £4	160 tea bags for £3

Which pack offers the best value for money

$$\frac{240}{5} = 48 \text{ for } £1 \qquad \frac{200}{4} = 50 \text{ for } £1 \qquad \frac{160}{3} = 53.3 \text{ for } £1$$

PAck C offers the best value for money

20 100 students attended a revision lesson at the weekend.

Each student went to Maths or English or Science.

55 of these students attended on Saturday.
Over the weekend a total of 40 students went to Maths.
12 of the 27 students that went to Science went on Sunday.
10 students went to English on Saturday.

How many students went to the Maths revision lesson on Saturday?

	Maths	English	Science	Total
Sat	30	10	15	55
Sun	10	23	12	45
Total	40	33	27	100

....................**30**....................

21 (a) Work out $\frac{2}{5} \div \frac{3}{4}$

$$\frac{2}{5} \times \frac{4}{3}$$

$$\frac{8}{15}$$

$$\frac{8}{15}$$

....

(2)

(b) Work out $\frac{1}{5} + \frac{2}{7}$

$$\frac{7 \times}{7 \times} \frac{1}{5} + \frac{2}{7} \frac{\times 5}{\times 5}$$

$$\frac{7}{35} + \frac{10}{35}$$

$$\frac{17}{35}$$

$$\frac{17}{35}$$

....

(2)

(Total for question 21 is 4 marks)

22 Solve $3(x + 4) = 19$

$$3x + 12 = 19$$
$$-12 -12$$

$$3x = 7$$

$$x = \frac{7}{3}$$

$$x = \frac{7}{3}$$

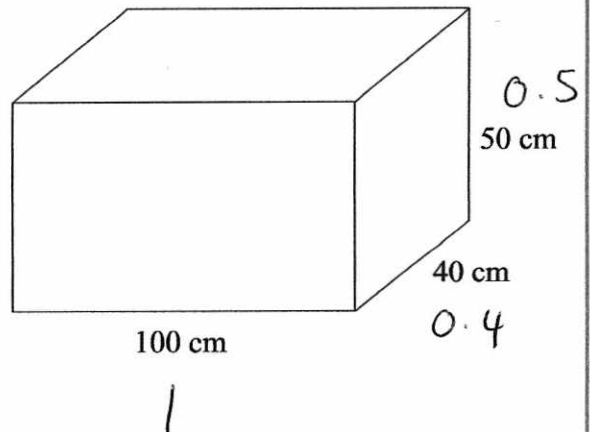.................................

(Total for question 22 is 2 marks)

23 The diagram shows a box.

5 of these boxes are going to be painted.

Each pot of paint can cover 6m².

How many pots of paint are needed to paint the 5 boxes?

0.5
50 cm

40 cm
0.4

100 cm

|

Surface area

$1 \times 0.5 = 0.5 m^2$ FRONT

$1 \times 0.5 = 0.5 m^2$ BACK

$1 \times 0.4 = 0.4 m^2$ TOP

$1 \times 0.4 = 0.4 m^2$ BOTTOM

$0.4 \times 0.5 = 0.2 m^2$ SIDE

$0.4 \times 0.5 = 0.2 m^2$ SIDE

$2.2 m^2$

5 boxes: total area $= 5 \times 2.2$
$= 11 m^2$

Each pot covers $6 m^2$

Two pots cover $12 m^2$

2 ....pots

(Total for question 23 is 4 marks)

24 In a box there are blue pens, red pens and green pens.
The ratio of blue pens to red pens to green pens is 5:3:2

There are 18 more blue pens than red pens.
How many green pens are in the box?

$$B : R : G$$
$$5 : 3 : 2$$

Difference between blue and red = 18 pens
= 2 parts

18 pens = 2 parts
9 pens = 1 part

45 : 27 : 18 .... 18 ....

(Total for question 24 is 3 marks)

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25 Four builders working 6 hours a day can build a wall in two days.

How many days will it take two builders working 8 hours a day to build the same wall.

4 × 6 × 2 = 48 hours of work needed

2 × 8 = 16 hours of work per day for the two builders

$$\frac{48}{16} = 3 \text{ days}$$ .... 3 ....days

(2)
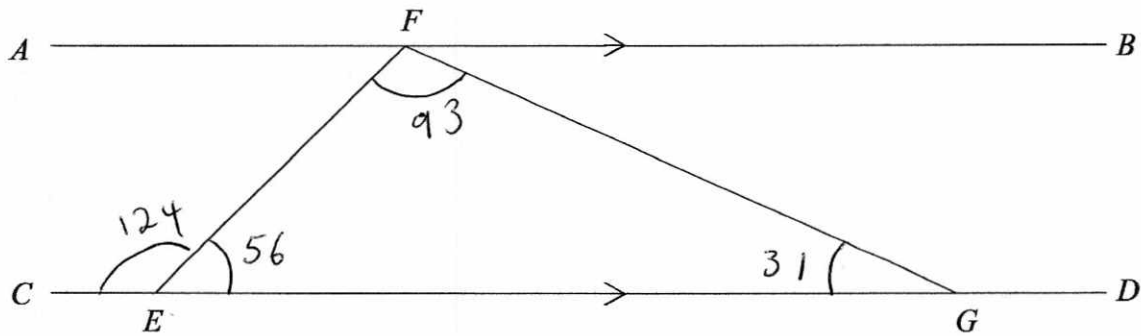
(b) State one assumption you made in your working out to part (a).

.... All of the builders work at the same rate ....

....

(1)

(Total for question 25 is 3 marks)

26

AB and CD are parallel.
Angle CEF = 124°
Angle EFG = 93°

Find the size of angle FGD.
You must show how you got your answer.

$$FEG = 56°$$
$$(180 - 124)$$

Angles on a straight line add to 180°

$$93 + 56 = 149°$$
$$180 - 149 = 31°$$

$$FGE = 31°$$

Angles in a triangle add to 180°
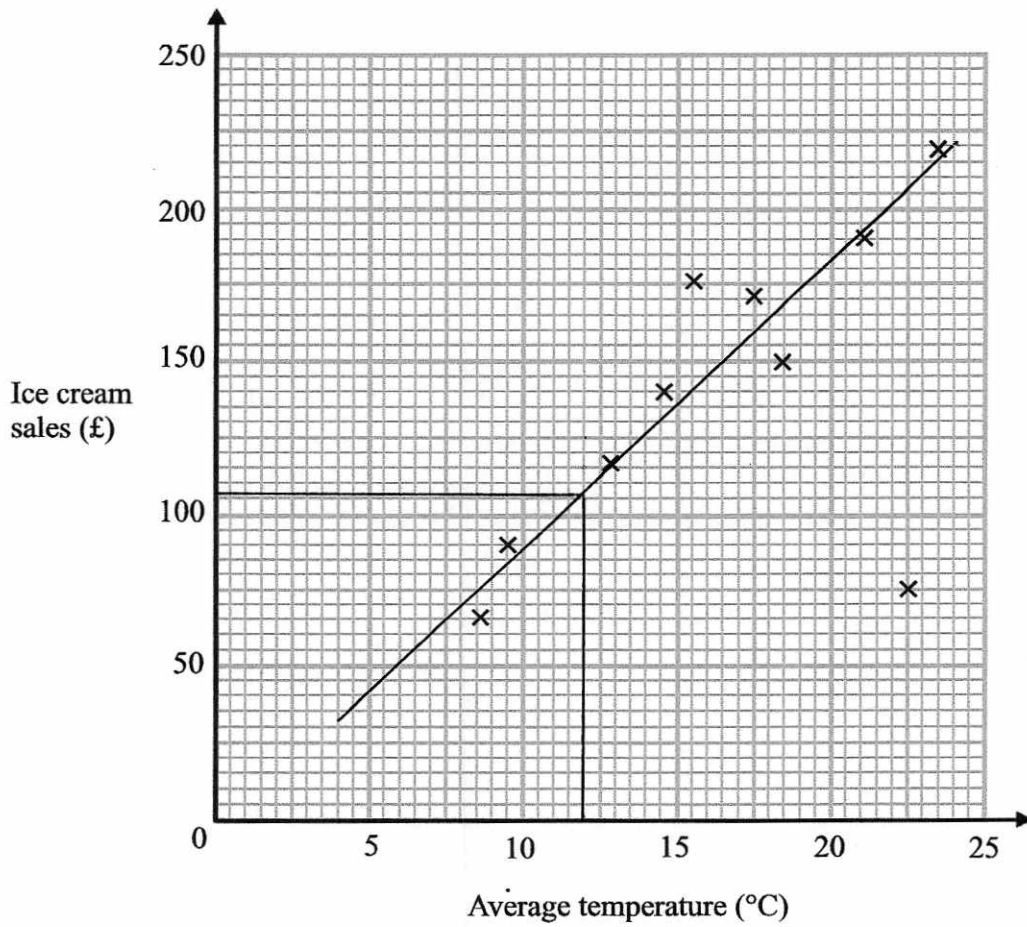
$$FGD = 180 - 31$$
$$= \underline{\underline{149°}}$$

Angles on a straight line add to 180°

..........149.......... °

(Total for question 26 is 3 marks)

27 The average daytime temperature for 10 days is recorded.
A shop also records its ice cream sales for each of the 10 days.

The scatter graph shows this information.

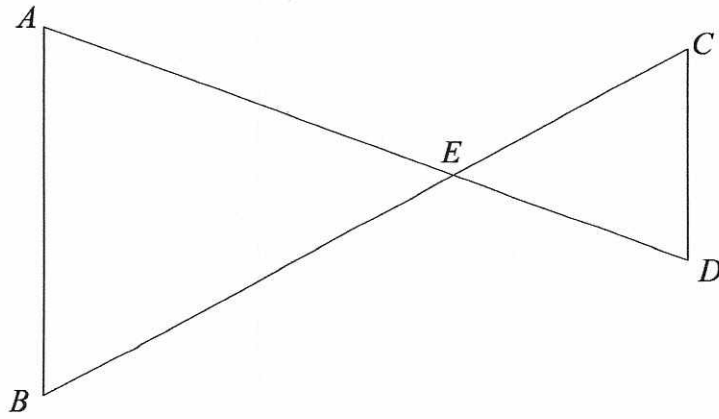(a) What type of correlation does the scatter graph show?

.... positive ....
(1)

(b) One of the points is an outlier. Write down the coordinates for this point.

(..22.5..) , (..75..)
(1)

(c) On another day the temperature was 12°.
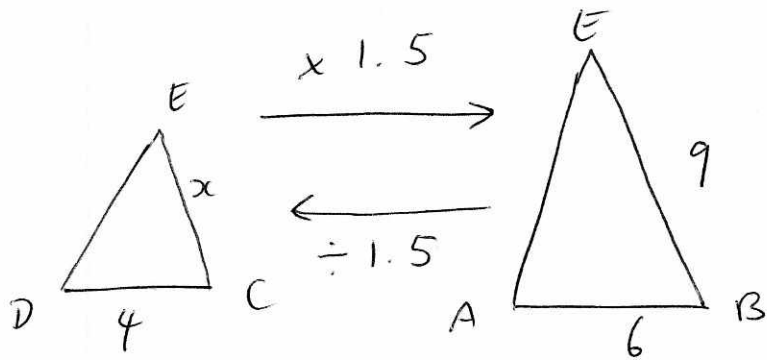Estimate the ice cream sales on this day.

£..........106..........
£100 — £120
(2)

(Total for question 27 is 4 marks)

28

AB and CD are parallel lines.
AD and BC are straight lines
AB = 6 cm,
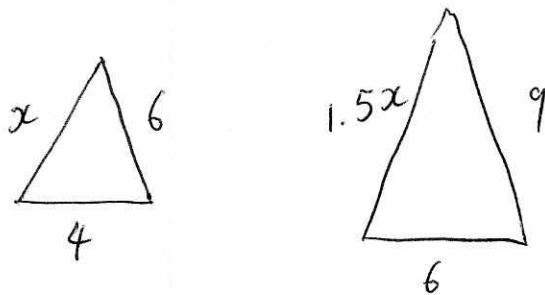CD = 4 cm,
BE = 9 cm,

(a) Find the length of CE

$\dfrac{6}{4} = 1.5$

$\dfrac{9}{1.5} = \dfrac{18}{3} = 6$

...........6...............cm
(1)

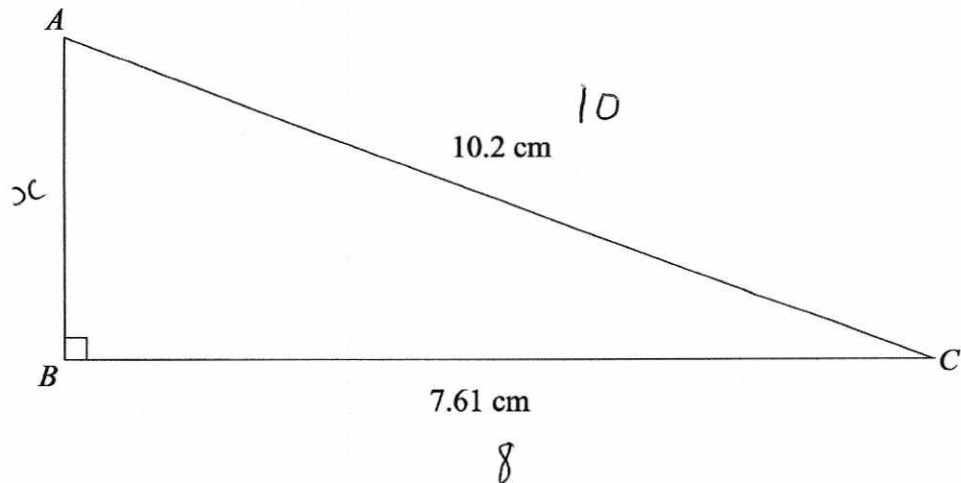AD = 12.5 cm

(b) Find the length of AE

$x + 1.5x = 12.5$
$2.5x = 12.5$
$\underline{\underline{x = 5}}$

$1.5x = 7.5$

7.5

.........~~5~~...........cm
(2)

(Total for question 28 is 3 marks)

29

A

10.2 cm   10

x

B   C

7.61 cm

8

(a) Estimate the length of AB

$$a^2 + b^2 = c^2$$

$$10^2 - 8^2 = x^2$$

$$100 - 64 = x^2$$

$$36 = x^2$$

$$x = 6$$

...............6...............cm

(2)

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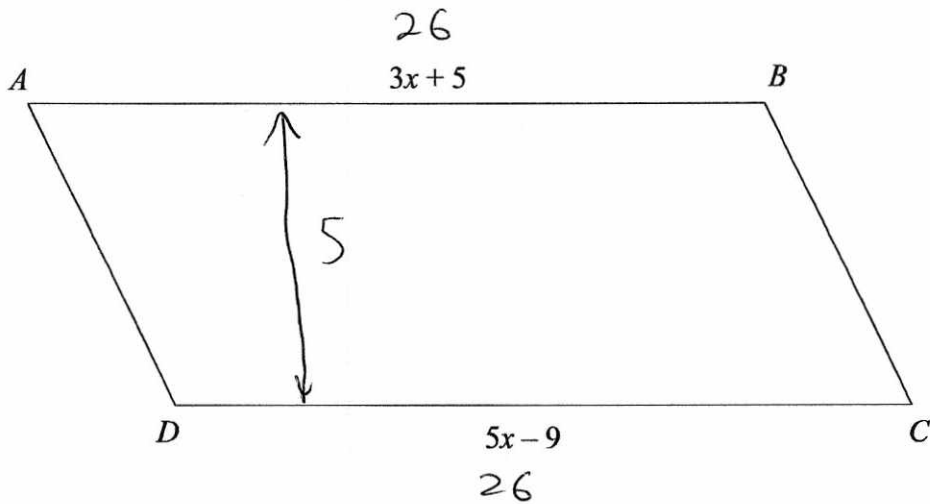Give a reason for your answer.

...... under estimate ...... The actual answer would be

... bigger, as 1 rounded 10.2 down and 7.61 up.

(1)

Bigger - Smaller = Bigger.

(Total for question 29 is 3 marks)

30

$$26$$

A $3x + 5$ B

5

D $5x - 9$ C

$$26$$

ABCD is a parallelogram
All measurements are in centimetres.
The height of the parallelogram is 5cm.

Find the area of *ABCD*

$$5x - 9 = 3x + 5$$
$$-3x \qquad\quad -3x$$

$$2x - 9 = 5$$
$$+9 \qquad +9$$

$$2x = 14$$

$$x = 7$$

$$3(7) + 5 = 26$$

$$26 \times 5$$

$$130 \, cm^2$$

(Total for question 30 is 4 marks)

31   Solve the simultaneous equations

$$5x + 2y = 24 \qquad \times 3$$
$$3x - y = 21 \qquad \times 5$$

$$15x + 6y = 72$$
$$15x - 5y = 105$$

$$11y = -33$$
$$y = -3$$

$$3x - (-3) = 21$$

$$3x + 3 = 21$$
$$-3 \qquad -3$$

$$3x = 18$$

$$x = 6$$

$x =$ 6

$y =$ .... -3

(Total for question 31 is 3 marks)