Write your name here:

Surname:	Other Names:

Mathematics
May/June 2017 Paper 2
Paper 2 (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

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.
- 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.

mathsgenie.co.uk

1 (a) Write these numbers in order of size.
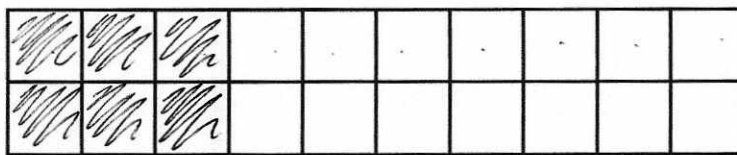   Start with the smallest number

$$5.6 \qquad 5.04 \qquad 4.6 \qquad 4.56 \qquad 5.46$$

4.56, 4.6, 5.04, 5.46, 5.6

(1)

(b) Write $7\frac{1}{2}$ as a decimal number.

7.5

(1)

(c) Shade 30% of this shape.

(1)

(d) Write 40% as a decimal.

0.4

(1)

(e) Write 0.87 as a fraction.

$\frac{87}{100}$
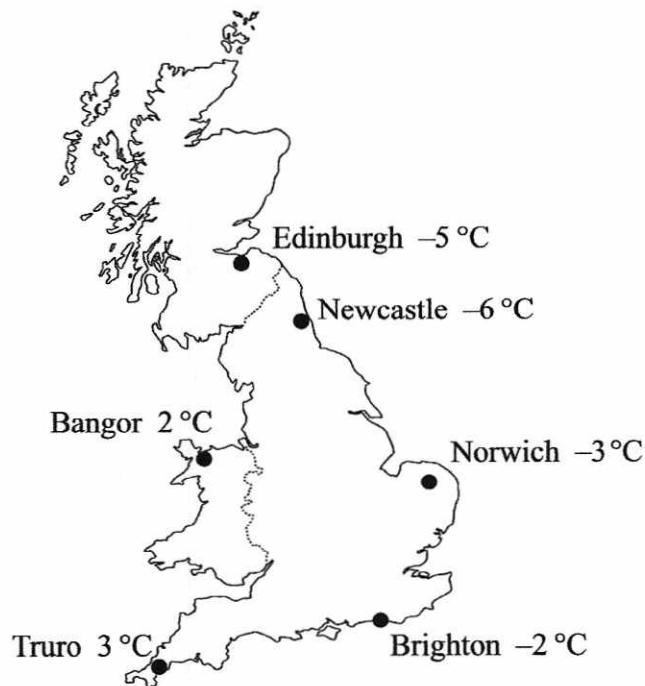
(1)

(f) Write $\frac{9}{16}$ as a decimal.

0.5625

(1)

(Total for Question 1 is 6 marks)

2   Here is a map of Great Britain.

The map shows the temperatures in some cities at midnight on 20th January.

Edinburgh −5 °C

Newcastle −6 °C

Bangor 2 °C

Norwich −3 °C

Truro 3 °C

Brighton −2 °C

(a) Which city had the lowest temperature at midnight?

Newcastle

(1)

In Brighton, the temperature rose by 5 °C between midnight on 20th January and midday on 21st January.

(b) What was the temperature in Brighton at midday on 21st January?

$-2 + 5$

3 ....°C

(1)

At midnight on 20th January, the temperature in Nottingham was halfway between the temperature in Truro and the temperature in Edinburgh.
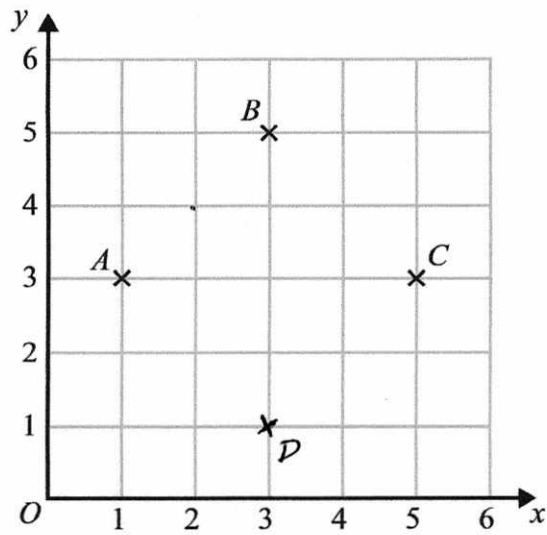
(c) What was the temperature in Nottingham?

$$\frac{3 + (-5)}{2} = \frac{-2}{2} = -1$$

−1 ....°C

(2)

(Total for Question 2 is 4 marks)

3

(a) Write down the coordinates of point *C*.

(5 , 3)

(1)

(b) Write down the coordinates of the midpoint of *AB*.

(2 , 4)

(1)

(c) On the grid, mark with a cross (×) the point *D* so that *ABCD* is a square.
Label this point *D*.

(1)

(Total for Question 3 is 3 marks)
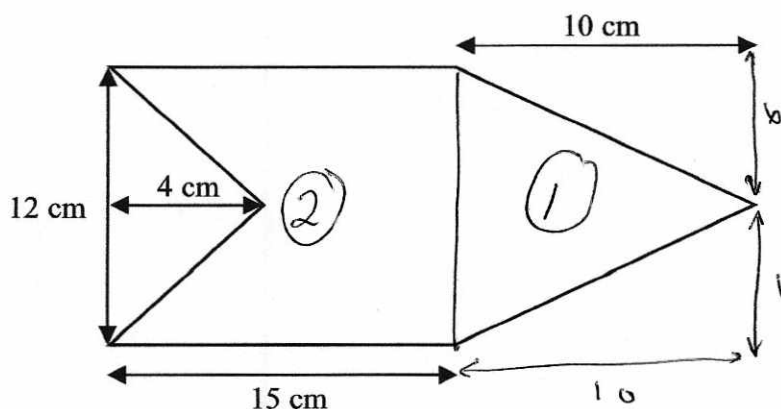
4 The diagram shows a shape with one line of symmetry.

10 cm

Diagram **NOT**
accurately drawn

12 cm

4 cm

②

①

15 cm

Work out the area of the shape.

Triangle ① $\dfrac{12 \times 10}{2}$ = $60 \, cm^2$

⅔ Shape ② = $12\boxed{}$ — $12 \triangleright$
                    15

= 12×15 — $\dfrac{12 \times 4}{2}$

= 180 — 24

= $156 \, cm^2$

$60 + 156$

$\underline{2\,1\,6}$ cm²
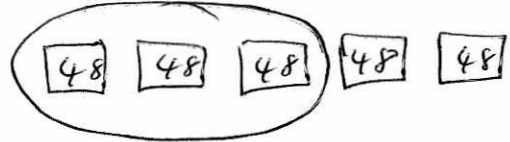
(Total for Question 4 is 4 marks)

5 There are 240 counters in a bag.
The counters are green or yellow or blue.

$\frac{3}{5}$ of the counters are green.
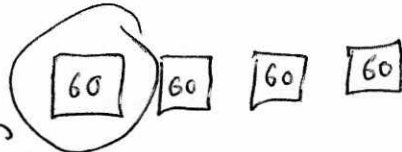
$\frac{1}{4}$ of the counters are yellow.

Work out the number of blue counters in the bag.

$\frac{1}{5}$ $\frac{240}{5}$ = 48 counters   48 48 48 48 48

$\frac{3}{5}$ 48 × 3 = 144 counters (GREEN)

$\frac{1}{4}$ 240 ÷ 4 = 60 counters   60 60 60 60
                        (YELLOW)

240 − 144 − 60 = 36 (Blue)

_____ 36 _____

(Total for Question 5 is 4 marks)

6

Stan's Driving School
First two lessons   £12.75 each lesson
All other lessons   £20.00 each lesson

Alex has 5 lessons with Stan's Driving School.

(a) Work out the total cost.

$$2(12.75) + 3(20) = 85.50$$

£ .....85.50.....

(2)

Leah has some lessons with Stan's Driving School.
The total cost of the lessons is £305.50

(b) Work out how many lessons Leah has.

First two lessons   12.75 each

$$2 \times 12.75 = £25.50$$

$$305.50 - 25.50 = £280$$

$$\frac{280}{20} = 14 \ (\text{more lessons})$$

$$14 + 2$$

..... 16 .....

(3)

(Total for Question 6 is 5 marks)

7 Rohan plays for his village cricket team.

Here are the number of runs he scored in each of six games.

$$12 \qquad 4 \qquad 35 \qquad 67 \qquad 32 \qquad 54$$

(a) Find the range of the number of runs Rohan scored.

$$67 - 4$$

63

(2)

(b) Find the mean of the number of runs Rohan scored.

$$\frac{12 + 4 + 35 + 67 + 32 + 54}{6}$$

34

(2)

One of the six games is picked at random.

(c) Find the probability that Rohan scored more than 50 runs in this game.

$$\frac{2}{6} \qquad \text{or} \qquad \frac{1}{3}$$

$$\frac{2}{6}$$

(2)

(Total for Question 7 is 6 marks)

8 Here is part of Dani's electricity bill.

> **Electricity Bill**
>
> New reading   2968 units
> Old reading   2675 units
>
> Price per unit   18p

Work out how much Dani has to pay for the units of electricity she has used.

$$2968 - 2675 = 293 \text{ units}$$

$$293 \times 18 = 5274 p$$

$$= £52.74$$

(Total for Question 8 is 4 marks)

9 A factory makes 1500 cans per minute.

The factory makes cans for 8 hours each day.

Each can is filled with 330 m*l* of cola. 0.33 litres $(\div 1000)$

How much cola is needed to fill all the cans that are made each day?
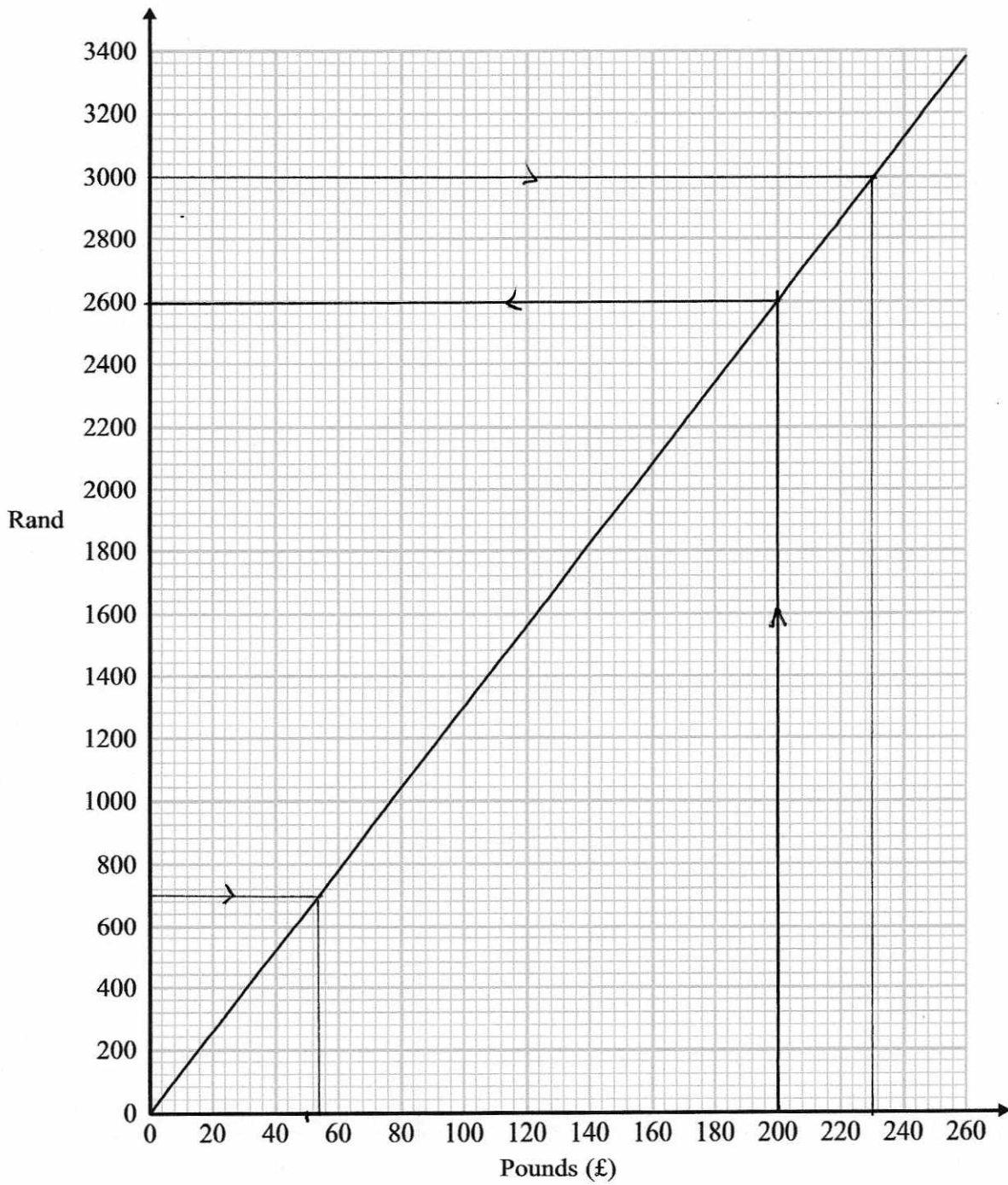Give your answer in litres.

$$1500 \text{ per minute}$$

$\times 60$

$$90000 \text{ per hour}$$

$\times 8$

$$720000 \text{ in 8 hours}$$

$$720000 \times 0.33 = 237600$$

$$\underline{237600}\text{litres}$$

(Total for Question 9 is 4 marks)

10 Here is a conversion graph to change between UK pounds (£) and South African rand.

Jo changes £200 into rand.

(a) How many rand does she get?

_____2 6 0 0_____ rand

(1)

Simon has £100 and 3700 rand.
He goes to a shop where he can spend both pounds and rand.

He wants to buy

a computer costing £360

or

a watch costing £400

or

a camera costing £375

(b) Which of these items can Simon afford to buy?
You must show clearly how you get your answer.

$$3000 \text{ rand} = £230,$$
$$700 \text{ rand} = £54,$$
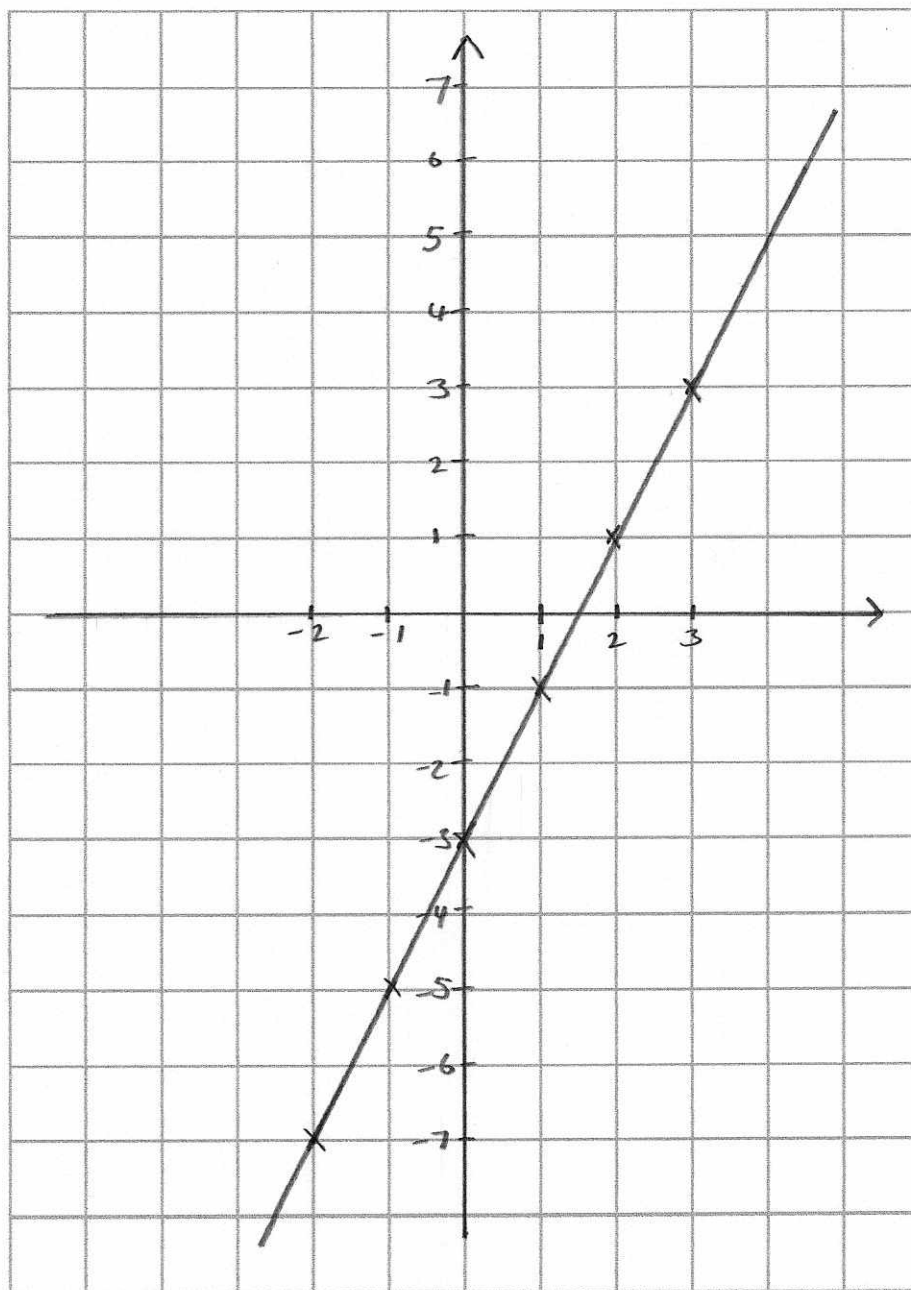$$3700 \text{ rand} = £284$$

Simon has 284 + 100 = £384

He can afford the computer and the camera

(3)

(Total for Question 10 is 4 marks)

11 On the grid, draw the graph of $y = 2x - 3$ for values of x from -2 to 3

x	-2	-1	0	1	2	3
y	-7	-5	-3	-1	1	3

(Total for Question 11 is 4 marks)

12 Here are two fractions.

$$\frac{2}{3} \qquad \frac{7}{8}$$

Which of these fractions has a value closer to $\frac{3}{4}$?

You must show clearly how you get your answer.

$$\frac{7}{8} - \frac{3}{4} = \frac{1}{8} = 0.125$$

$$\frac{3}{4} - \frac{2}{3} = \frac{1}{12} = 0.08\dot{3}$$

$$\frac{2}{3} \text{ is closer.}$$

(Total for Question 12 is 3 marks)

13 (a) Expand $7(x + 5)$

$$7x + 35$$
(1)

(b) Expand $3y(4y - 3)$

$$12y^2 - 9y$$
(1)

(c) Expand and simplify $(t + 2)(t + 4)$
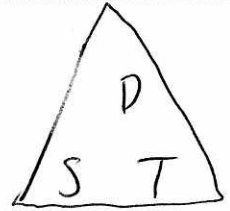
$$t^2 + 4t + 2t + 8$$

$$t^2 + 6t + 8$$
(2)

(Total for Question 13 is 4 marks)

14 Sue is driving home from her friend's house.

Sue drives

> 10 miles from her friend's house to the motorway
> 240 miles on the motorway
> 5 miles from the motorway to her home

Sue

> takes 20 minutes to drive from her friend's house to the motorway
> drives at an average speed of 60 mph on the motorway
> takes 25 minutes to drive from the motorway to her home

Sue stops for a 30 minute rest on her drive home.

Sue leaves her friend's house at 9.00 am.

What time does Sue get home?
You must show all your working.

$$\text{time} = \frac{\text{distance}}{\text{speed}}$$

$$= \frac{240}{60} = 4 \text{ hours}$$

9 : 00

9 : 20   Motorway

9 : 50   rest

13 : 50   off Motorway

14 : 15   home

14 : 15
....

(Total for Question 14 is 3 marks)
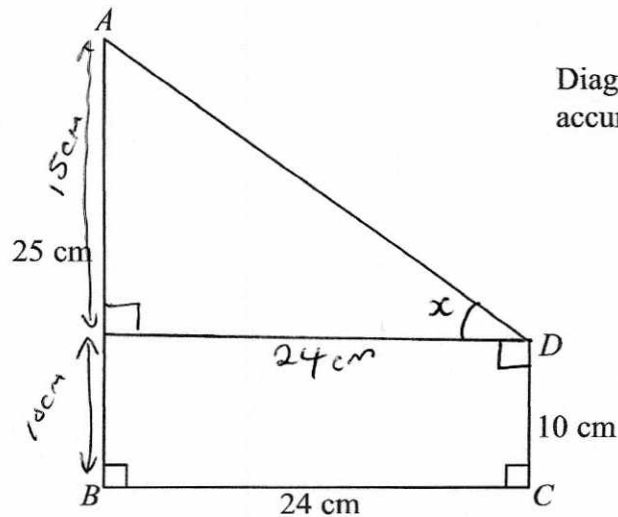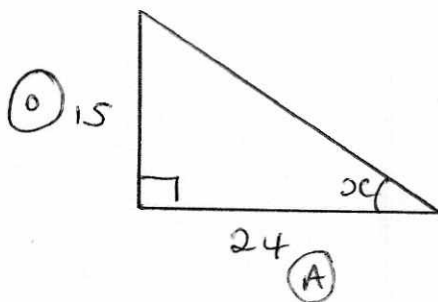
1 *ABCD* is a trapezium.

Diagram **NOT** accurately drawn

AB = 25 cm.
BC = 24 cm.
CD = 10 cm.

Angle *ABC* = angle *BCD* = 90°

Calculate the size of angle *CDA*.
Give your answer correct to 3 significant figures.

$$\tan x = \frac{o}{A}$$

$$\tan x = \frac{15}{24}$$

$$x = \tan^{-1}\left(\frac{15}{24}\right)$$

$$= 32.00538321°$$

$$CDA = 90 + "32.00538321"$$

$$= 122° \ (3sf)$$

<u>122</u> °

(Total for Question 1 is 4 marks)

2 In the 2012 Paralympic Games, the total number of gold and silver medals won by Brazil was 35

The ratio of the number of gold medals that Brazil won to the number of silver medals that Brazil won was 3 : 2

How many silver medals were won by Brazil?

G   S
3 : 2

☐7☐ ☐7☐ ☐7☐ : ☐7☐ ☐7☐

$\frac{35}{5} = 7$

$2 \times 7 = 14$

14

(Total for Question 2 is 2 marks)

3 Jalin lives in England.
He does a search on the internet and sees the same type of camera on sale in France and in America.

In France, the camera costs 126 euros.
In America, the camera costs $165.24

Jalin finds out these exchange rates.

Exchange rates
1 euro = £0.89
£1 = $1.62

How much cheaper is the camera in America than in France?
Give your answer in pounds (£).

FRANCE : $126 \times 0.89 = £112.14$

AMERICA $165.24 \div 1.62 = £102$

$112.14 - 102 = £10.14$

£ 10.14

(Total for Question 3 is 4 marks)

4 A group of 200 adults were asked which types of magazines they read.

Their replies showed that

82 read Sports magazines
80 read Garden magazines
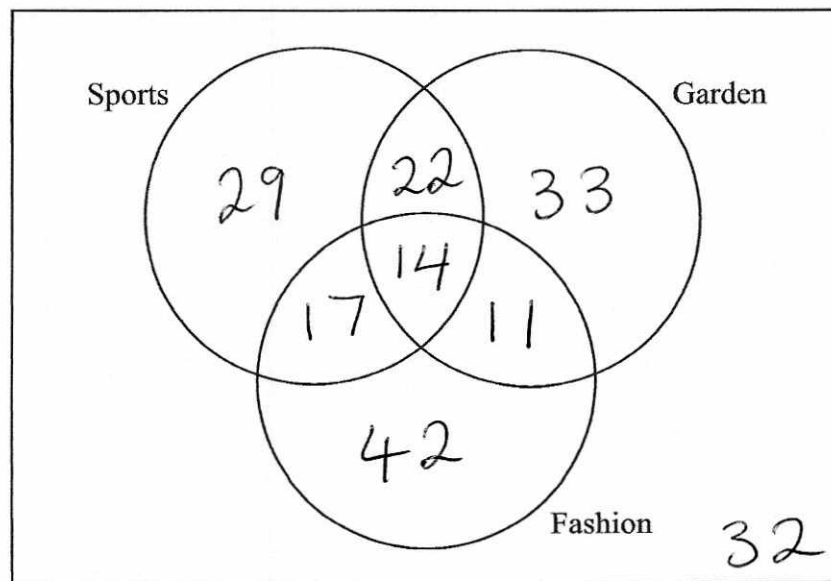84 read Fashion magazines
36 read Sports magazines and read Garden magazines
31 read Sports magazines and read Fashion magazines
25 read Garden magazines and read Fashion magazines
14 read Sports magazines and read Garden magazines and read Fashion magazines

(a) Complete the Venn diagram for this information.

(4)

One of the adults asked is to be chosen at random.

(b) Find the probability that this adult

(i) reads none of these magazine types,

$\dfrac{32}{200}$

(ii) reads exactly two of these magazine types.

$\dfrac{17 + 11 + 22}{200}$

$\dfrac{50}{200}$

(3)

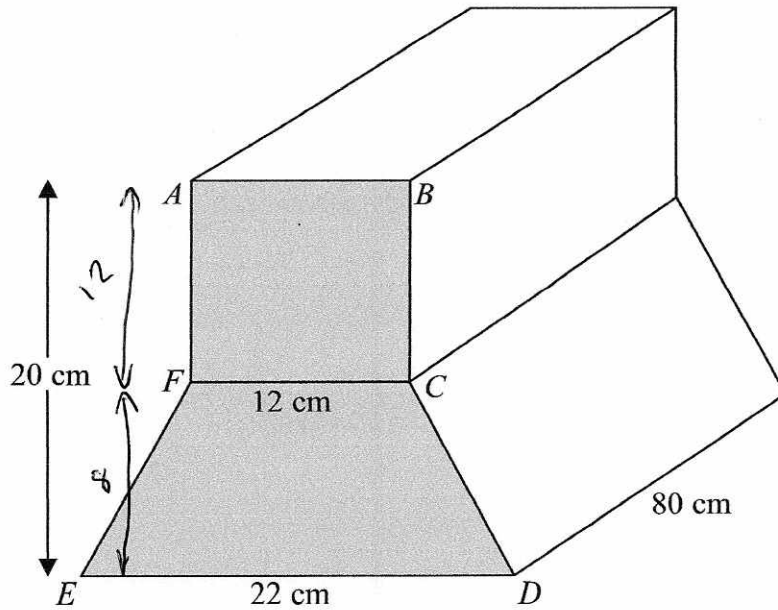**(Total for Question 4 is 7 marks)**

5 Here is a prism.

Diagram **NOT** accurately drawn

20 cm

12 cm

22 cm

80 cm

A B F C E D

ABCDEF is a cross section of the prism.

ABCF is a square of side 12 cm.

FCDE is a trapezium.
ED = 22 cm.

The height of the prism is 20 cm.
The length of the prism is 80 cm.

Work out the total volume of the prism.

Area of Square = 12 × 12 = 144 cm²

Area of trapezium = $\frac{12 + 22}{2}$ × 8 = 136 cm²

Area of cross section = 144 + 136 = 280 cm²

280 × 80 = 22400 cm³

_____22400_____ cm³

(Total for Question 5 is 5 marks)