Surname	Centre Number	Candidate Number
Other Names		0

GCSE

3310U20-1

A17-3310U20-1

MATHEMATICS – NUMERACY
UNIT 2: CALCULATOR-ALLOWED
FOUNDATION TIER

WEDNESDAY, 8 NOVEMBER 2017 – MORNING

1 hour 30 minutes

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**19**	
2.	**7**	
3.	**6**	
4.	**6**	
5.	**5**	
6.	**6**	
7.	**4**	
8.	**12**	
Total	**65**	

3310U201
01

ADDITIONAL MATERIALS

A calculator will be required for this paper.

A ruler, a protractor and a pair of compasses may be required.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** the questions in the spaces provided.

If you run out of space, use the continuation page at the back of the booklet. Question numbers must be given for all work written on the continuation page.

Take π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

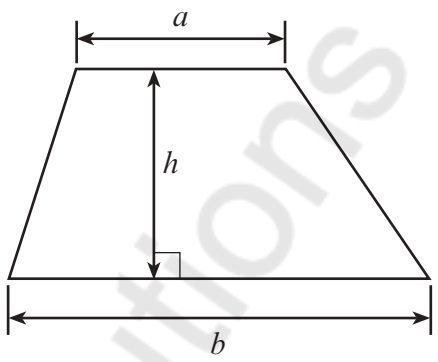
Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

In question **1***(a)*, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

Formula List - Foundation Tier

Area of trapezium $= \frac{1}{2}(a + b)h$



Examiner only

1. (a) *In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Evan wants to book a holiday in Cyprus for one week.
He finds a holiday using the internet.

Hotel Amathas ★★★★

£860 per adult for one week
£500 per child for one week
(HALF BOARD)

Half board includes breakfast and evening meal.
Full board includes breakfast, lunch and evening meal.

UPGRADES (for one week)
FULL BOARD extra £80 per adult, extra £55 per child
Extra £115 for a room with a sea view.

DISCOUNT
10% discount for payment in full at the time of booking.

- Evan wants to book one room for two adults and one child.
- He wants an upgrade to full board for all three people.
- He wants a room with a sea view.

Evan pays in full when he books the holiday.
Work out the total cost.
You must show all your working. [6 + 2 OCW]

€2295

Bookings:
Two adults
One child
Upgrade to Full boards all 3 people
Also, Room with a sea view
Payment in full [10% discount]
Booking for two adults and 1 child [Before upgrade]
Total = 860 X 2 + 500 X 1 = € 2220.
Since we have full boards: Payment for upgrade
Upgrade = 80 X 2 + 55 = € 215.
Room close to sea view cost extra = €115
Total payment = € 2220 + € 215 + € 115
Cost = € 2550 //
Payment in full requires 10% discount
10% discount = $\frac{10}{100} \times 2550$ = € 255 discount

Cost = €2550 − €255 = €2295

Examiner only

(b) Evan and his family will fly from Cardiff Airport to Larnaca International Airport in Cyprus.

How long will this flight take? [2]

Time leaving Cardiff 15:00 UK
Arrived Time Larnaca 22:00 Cyprus
Cyprus is 2hrs ahead of UK:
Time leaving Cardiff 15:00 UK
Time leaving Cardiff 17:00 Cyprus
5hrs

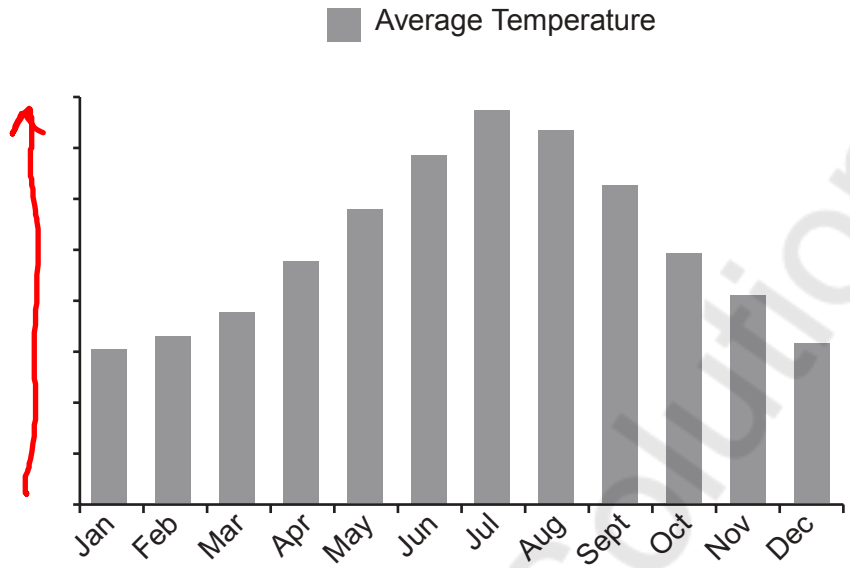
..... hours

17:00 — 22:00

17 — 18 18 — 19 19 — 20
20 — 21 21 — 22

Examiner only

(c) Evan sees this graph on a website.
It shows information about the weather in Larnaca.



Give **one** criticism of this graph. [1]

There vertical axis doesn't have a label or numerical values, so we don't know the value of each month.

(d) Evan sees this information about the average monthly rainfall, in mm, in Larnaca.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	78	64	34	19	7	2	1	1	6	18	66	94

(i) Which of the words below best describes the chance that it will rain in Larnaca on any given day in **August**?
Circle your answer. [1]

certain likely even chance unlikely impossible

(ii) Which month has an average rainfall closest to **7 centimetres**?
Circle your answer. [1]

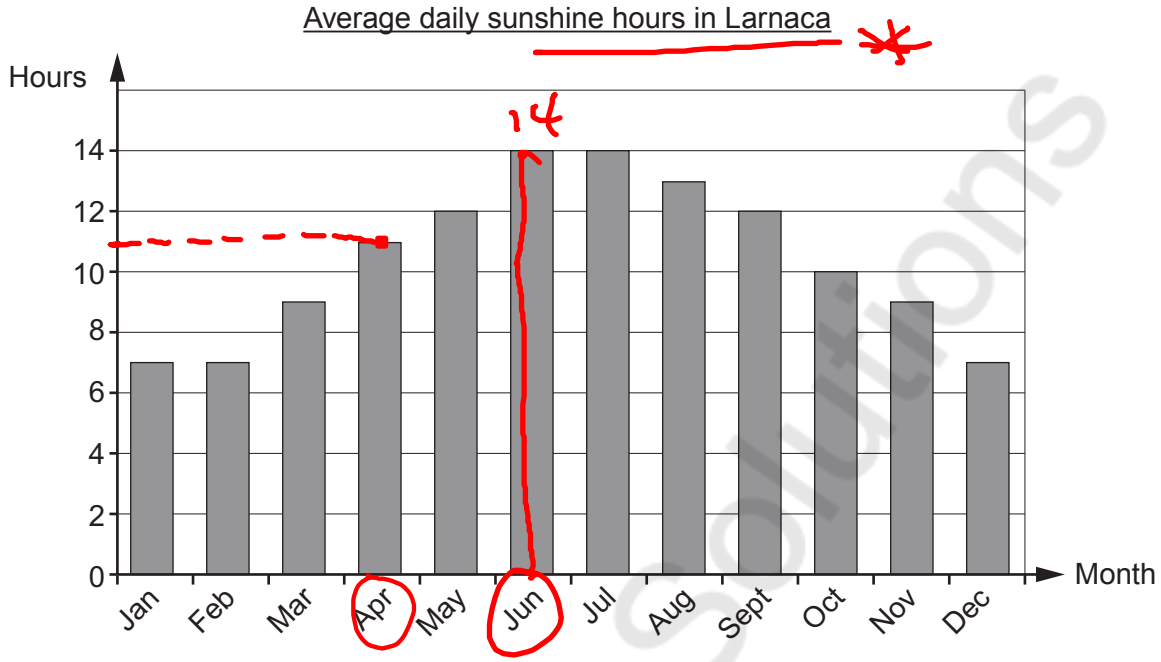
7cm

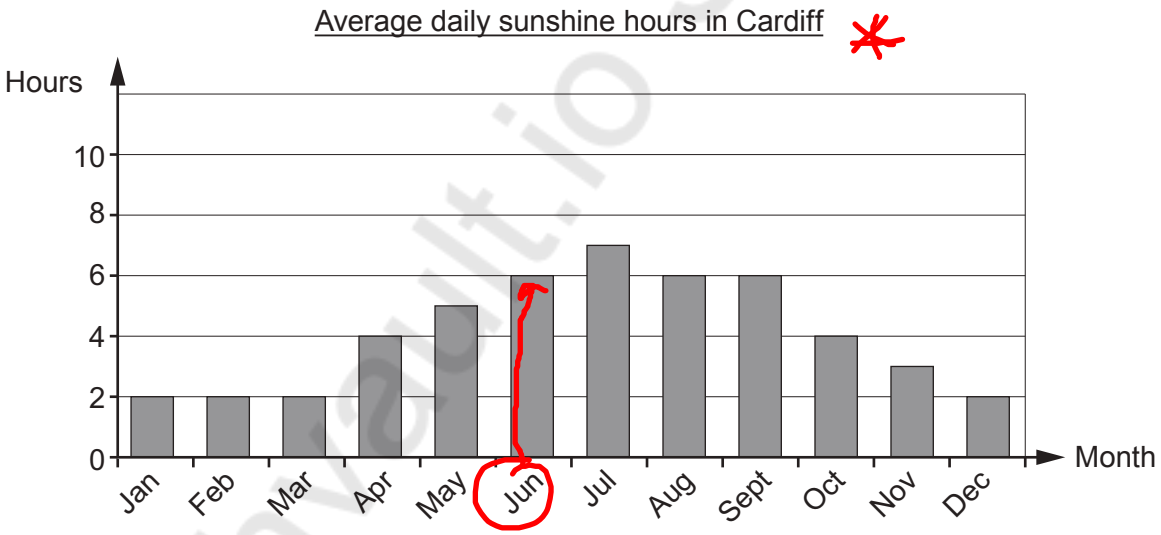
January February May September November

1cm = 10mm
7cm = 70mm

Examiner only

(e) Evan uses internet graphs to compare the average daily sunshine hours in Cardiff and Larnaca.





(i) In Larnaca, which month had an average of 11 daily sunshine hours? [1]

Month ..... April .....

(ii) Find the number of **extra** average daily sunshine hours in Larnaca compared with Cardiff in June. [2]

Average daily sunshine in Larnaca [June] = 14h

Average daily sunshine in Cardiff [June] = 6hr

Difference = 14 − 6 = 8hours

Examiner only

(f) Evan sees this information about the **highest** daily temperature for each month in Larnaca last year.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature (°C)	17	17	19	23	25	30	32	33	30	32	27	17

(i) What is the median of these temperatures? [2]

Median = 25

Median is the middle value of a well arranged data [ascending / descending]

17, 17, 17, 19, 23, 25, 27, 30, 30, 32, 32, 33

(ii) Explain why the mode of these temperatures is not suitable as an average. [1]

Mode: 17 mode

Since 17 is the mode, it is very cold and it doesn't represent the data given.

Examiner only

2. Declan has two pet rabbits.
He wants to buy a new rabbit hutch.

Declan finds a rule to work out the amount of floor space that each rabbit should have in the hutch.

Floor space needed = mass of rabbit × 1800

Floor space is measured in cm^2.
Mass is measured in kg.

(a) Declan's larger rabbit weighs 3·2 kg.
What floor space should this rabbit have in the hutch? [2]

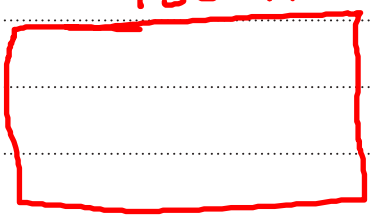
weight = 3.2kg
Floor space needed = mass of rabbit × 1800
= 3.2 × 1800
= 5760 cm^2

(b) Declan works out that his smaller rabbit needs 4860 cm^2 of floor space.
What is the mass of the smaller rabbit? [2]

Floor space needed = 4860 cm^2
weight = ?
Floor space needed = mass × 1800
mass = Floor space needed / 1800
mass = 4860 / 1800 = 2.7kg

Examiner only

(c) Declan sees a hutch with a rectangular floor that measures 150 cm by 80 cm.
Show that this hutch has enough floor space for the two rabbits.
You must show all your working. [3]



mass of the two rabbit
3.2kg 2.7kg
5760cm² 4860cm²

Area = L × B
Area = 150 × 80
Area = 12,000 cm²

So, the two rabbit need a space of = 10,620cm²

Since the Area of the hutch (12,000 cm²) is greater than the area of space need by the rabbit (10,620 cm²). Then the hutch has enough space for the two rabbits.

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Examiner only

3. Mair has an old family recipe for making Welsh cakes.

Ingredients for 10 Welsh cakes

8 ounces plain flour
4 ounces butter
3 ounces caster sugar
2 ounces currants
1 egg

(a) Mair wants to make 40 Welsh cakes.
Complete the recipe. [1]

Ingredients for 40 Welsh cakes

32 ounces plain flour

16 ounces butter

12 ounces caster sugar

8 ounces currants

4 eggs

(b) Flour is sold in packs weighing one kilogram each.
Mair knows that she needs 2 pounds of flour to make 40 Welsh cakes.
Is a one kilogram pack of flour enough?
Give a reason for your answer. [1]

2 pounds of flour → 40 Welsh cakes
1 kg of flour, is it enough?
1 kg → 2·2 pounds
1 kg ≡ 2·2 pound.
Yes, it is enough, since 1 kg is 2·2 pounds and he needs only 2 pounds to make 40 Welsh cakes
So, there is extra 0·2 pounds left.

Examiner only

(c) Mair sells Welsh cakes to a tearoom.
She sells 40 Welsh cakes every week for 12 weeks.
The weekly cost of making the Welsh cakes is £4.50.
She charges the tearoom 25p for each Welsh cake.
How much profit does Mair make in total over the 12 weeks?
Give your answer in £. [4]

Every weeks she sold 40 cakes
So, for 12 weeks, she would have sold 12×40
Total sales for 12 weeks = 480 cakes
Weekly cost of welsh cakes = £4.50
12 weeks cost will be = 4.50×12
= £54
Charges for each welsh cake is 25p
Total Charge for 480 cakes = 25×480
= 12000p

Profit = £ 66

TC = £120

£1 = 100p

12000 = £ 12000p / 100p = £120

Profit = Total Charge − Cost
= 120 − 54
= £66

Examiner only

4.

Raspberries cost £3.60 per kg

Pears cost £2.60 per kg

Rate of Raspberries cost = Cost / mass

Rhys buys some raspberries and some pears.
Rhys weighs the fruit he buys.
The raspberries cost him £4.50.

(a) Calculate the mass of the raspberries Rhys buys. [2]

Raspberries cost €3.60 per kg

$R = \frac{C}{m}$; $m = \frac{C}{R} = \frac{4.50}{3.60} = 1.25\text{kg}$

(b) He finds that the mass of the pears is three times the mass of the raspberries.
How much change does Rhys get from £20 when buying the raspberries and pears?
You must show all your working. [4]

Since mass of raspberries is 1.25kg

mass of pears = $3 \times 1.25 = 3.75$kg

Cost of raspberries = €4.50

Cost of pears = ?

$R = \frac{C}{m}$; $C = R \times m$

$C = 2.60 \times 3.75 = €9.75$ ✓

Total Cost of fruits = €9.75 + €4.50

= €14.25

Rhys Account = €20

Balance = 20 − 14.25

= €5.75

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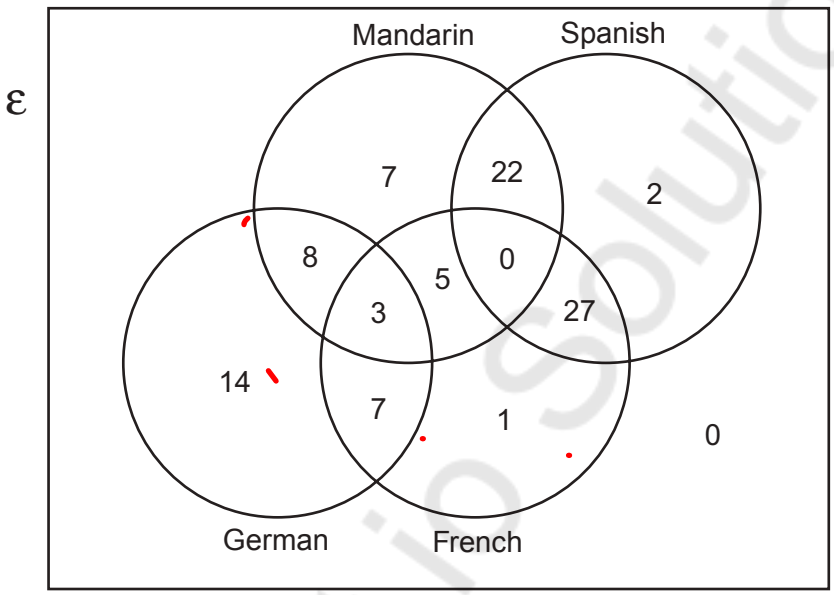
Examiner only

5. The Headteacher of Ysgol Maes Newydd gave *option forms* to all Year 9 pupils.

The form asked which foreign languages the pupils would like to study in Year 10.

There were 4 languages listed on the form: French, German, Spanish and Mandarin.
The pupils could select as many of the languages as they wished.
All pupils completed and returned the *option form*.

The Headteacher displayed the results in a Venn diagram, as shown below.



(a) How many pupils did not select at least one of the four languages?
Circle your answer. [1]

0 1 3 5 7

(b) How many pupils are there in Year 9?
Circle your answer. [1]

92 94 96 98 100

(c) How many pupils selected only one language? [1]

14 + 7 + 2 + 1 = 24

Examiner only

(d) The Headteacher can offer only 2 out of these 4 languages in Year 10.
She writes the timetable so that as many as possible of the pupils who chose 2 languages are able to study those 2 languages.
Which **two** languages will the Headteacher offer in Year 10?
You must show all your working and give a reason for your answer. [2]

Mandarin & French = 8

Mandarin & German = 8

Mandarin & Spanish = 22

French & German = 10

French & Spanish = 27 .

German & Spanish = 0

Since, French and Spanish has the highest pupil that study 2 of these languages, Then, the head master will take french and Spanish.

Examiner only

6. Lloyd has carried out a survey in his school.
He surveyed 300 pupils.
Below is a section from his questionnaire.

1.	Which year group are you in? .....
2.	Do you like the colours of the school uniform? .....
3.	What is your favourite colour? .....

(a) Afterwards, Lloyd thinks he should have given option boxes in questions 1 and 2.
What could these option boxes be? [2]

Question 1:

Year 8 ☐ Year 9 ☐ Year 10 ☐

.....

.....

Question 2:

Yes ☐ No ☐ Other ☐

.....

.....

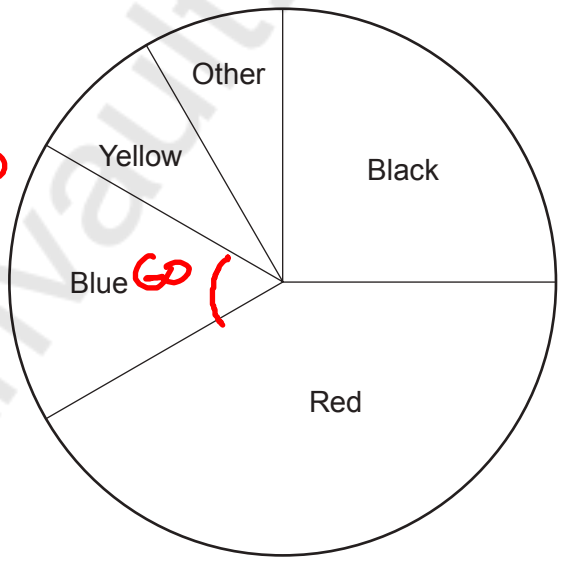
(b) A pie chart displaying the results from question 3 of the questionnaire is shown below.

Angle of 75 pupils

$\theta = \frac{\text{No of Pupil}}{\text{Total no of Pupils}} \times 360$

$\theta = \frac{75}{300} \times 360$

$\theta = 90°$



$\frac{60}{360} = \frac{1}{6}$

(i) Which colour was chosen by 75 pupils as their favourite colour?
Circle your answer. [1]

Black Red Blue Yellow Other

.....

Assuming Blue has $\theta = 60°$

Number of blues $= \frac{\theta}{360} \times$ Total people $= \frac{60}{360} \times 300$

Examiner only

(ii) What fraction of the pupils said that blue was their favourite colour?
Give your answer in its simplest form. [3]

Blue $= 50°$

Fraction of Blue $= \frac{50}{300} = \frac{1}{6}$

7. *(a)* What is 3 hours 12 minutes in hours?
Circle your answer. [1]

3·102 hours 3·12 hours 3·15 hours **3·2 hours** 3·25 hours

3hrs 0·2hrs

60 minutes = 1hr

12 × 1min $= \frac{1}{60}$ hr × 12

3hrs = 3hrs

3·2hrs

12minutes = 0·2hrs

12minutes $= \frac{1}{60}$ hr × 12

(b) The first 40 miles of a journey took 1 hour 15 minutes.
The remaining 80 miles were completed in 2 hours 15 minutes.
Calculate the average speed, in mph, of the 120-mile journey. [3]

40miles → 1hr 15 minutes

↓

Remaining 80miles → 2hrs 15 minutes

A·S = Total Distance / Total time

Distance = 120miles

Total time = 1hr 15min + 2hrs 15min

= 3hrs 30mins

= 3·5 hrs

A·S $= \frac{120}{3.5} = 34.29$ mph

Examiner only

8. A newspaper report claimed the following:

- 12% of the world population is left-handed.
- Twice as many men as women are left-handed.
- 30% of the world population is mixed-handed.
  Mixed-handed people prefer to use the left hand for some tasks and the right hand for others.
- It is very rare to be ambidextrous, that is being able to do all tasks equally well with either hand.

women x men $2x$

In 2011, Wales had a population of 3063000.
In 2014, Wales had a population of 3092000.

(a) Calculate the number of left-handed people living in Wales in 2011.
State what assumption you have made. [3]

2011: Population = 3,063,000

2014: Population = 3,092,000

Left hand = 12% of population

$= \frac{12}{100} \times 3,063,000 = 367,560$

Assumption:

We assume that 12% of the world population is the same as 12% of wales population i.e The newspaper is correct for wales population.

(b) In 2011, Wales had a population of 3063000.
1559000 of these people were women.

In 2011, what **percentage** of the population of Wales were **men**?
Give your answer correct to 1 decimal place. [3]

% of men = $\frac{\text{number of men}}{\text{total population}} \times 100$

men = 3063000 − 1559000 = 1,504,000

% of men = $\frac{1,504,000}{3,063,000} \times 100 =$

% of men = 49.1%

Examiner only

(c) How many mixed-handed people do you think were living in Wales in 2014?
You must show your working.
Give your answer to the nearest 1000 people. [2]

Population in wales in 2014 = 3,092,000
% of mixed handed people = 30%
mixed handed people = 30% of population in wales
mixed handed people = $\frac{30}{100} \times 3092000$
$= 927,600$
To nearest 1000 = 928,000 ✓

(d) A country of 6 million people meets all the claims given in the newspaper report.
8% of the women in this country are left-handed.

There are 3 million men living in this country.
How many left-handed men would you expect there to be in this country? [4]

Total population = 6,000,000
Men = 3,000,000
women = 3,000,000
8% of women are left handed
left handed women = $\frac{8}{100} \times 3,000,000$
$= 240,000$ women LH

Left handed people = $\frac{12}{100} \times 6,000,000$
$= 720,000$ people are left handed

man that are left handed = 720,000 − 240,000
$= 480,000$ men are left handed

END OF PAPER

Question number	Additional page, if required. Write the question number(s) in the left-hand margin.

Examiner only