

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Statistics

Interpreting pie charts

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

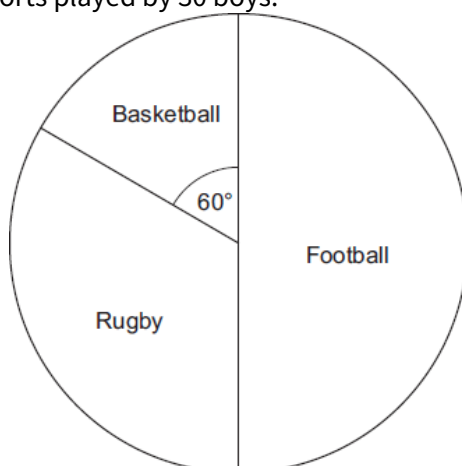
- In all calculations, show clearly how you work out your answer

For questions 1 to 4 you must **NOT** use a calculator.



Q1.

The pie chart shows the sports played by 30 boys.



(a) How many boys play Football?

(1)

(b) How many boys play Rugby?

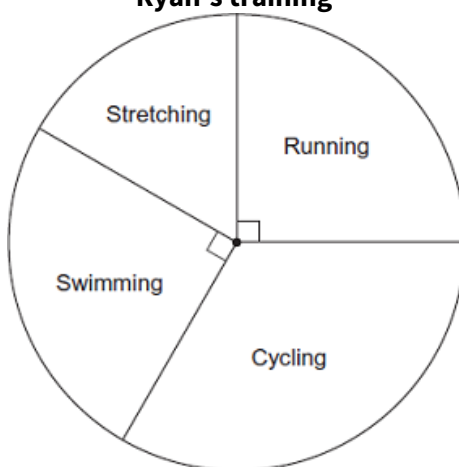
(2)

(Total 3 marks)

Q2.

Ryan trained for 6 hours. Information about his training times is shown in the pie chart.

Ryan's training



(a) How long did Ryan spend running?

(1)

(b) Ryan spent twice as long cycling as stretching.
What fraction of the 6 hours did Ryan spend stretching?
Give your answer in its simplest form.

(3)

(Total 4 marks)

Q3.

The pie charts show the eye colour of some students.



The areas of the pie charts are proportional to the number of students.

The radius of the girls' pie chart is 5 cm

The radius of the boys' pie chart is 4 cm

5 girls have green eyes.

How many boys and girls altogether have blue eyes?

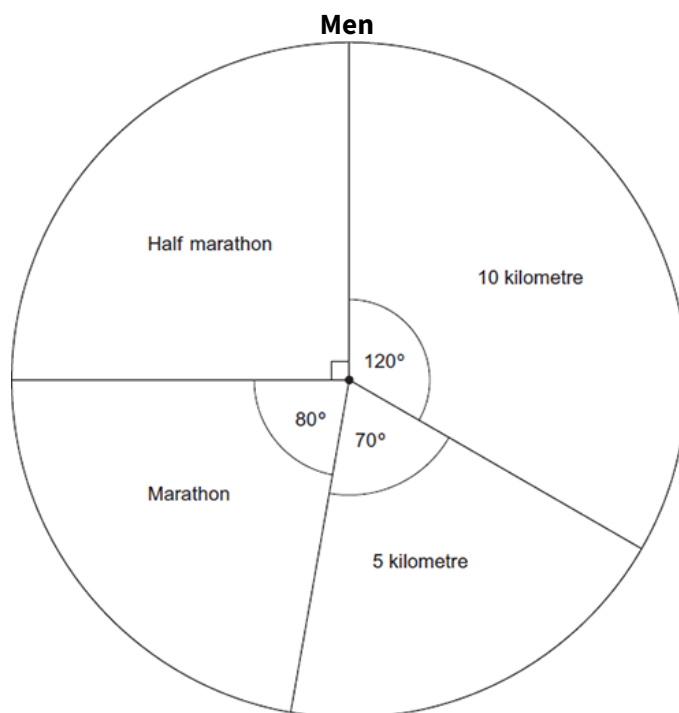
(Total 5 marks)

Question 4 is **higher** tier only

Q4.

There are 36 men in a running club.

The pie chart shows information about their favourite races.



There are 20 women in the running club.

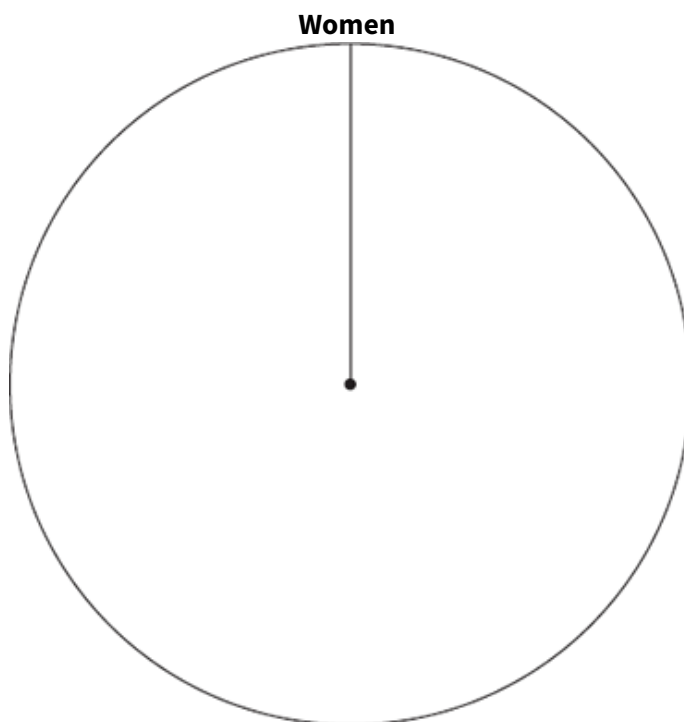
Here is information about their favourite races.

The same **proportion** of women prefer the half marathon as men.

The same **number** of women prefer 5 km races as men.

Equal numbers of women prefer 10 km races and the marathon.

Use this information to draw a fully labelled pie chart to show the favourite races of the women.



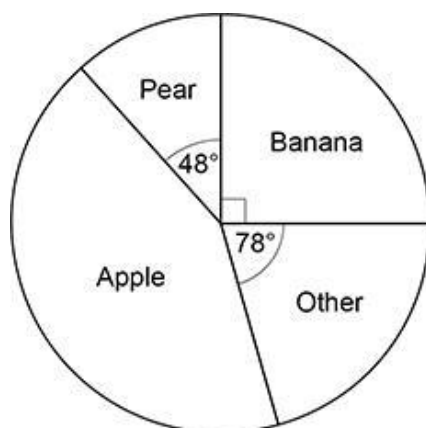
(Total 4 marks)

For the rest of the questions, you may use a calculator.



Q5.

Some people were asked to choose their favourite fruit.
The pie chart shows information about the results.



Not drawn
accurately

120 people chose Banana.
How many people chose Apple?

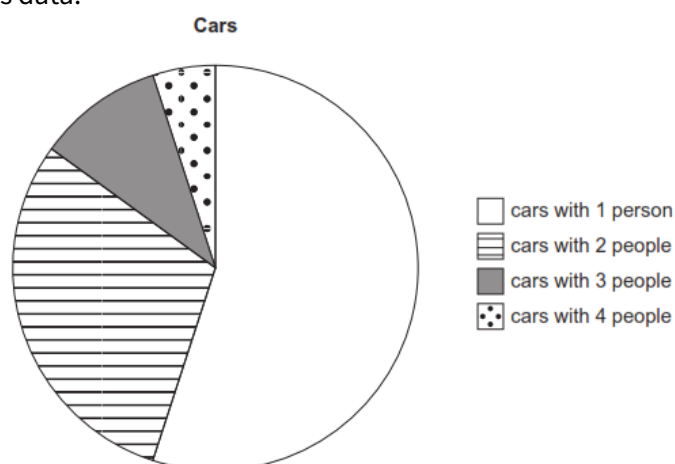
(Total 4 marks)

Q6.

A council sets this target to reduce traffic.

More than 40% of cars should have 2 or more people in them.

The council collects data.

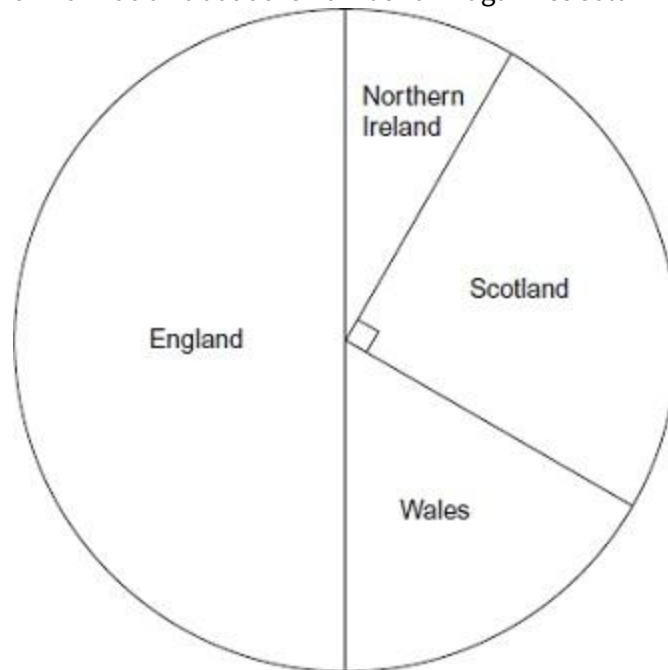


Is the target met?
Show how you decide.

(Total 3 marks)

Q7.

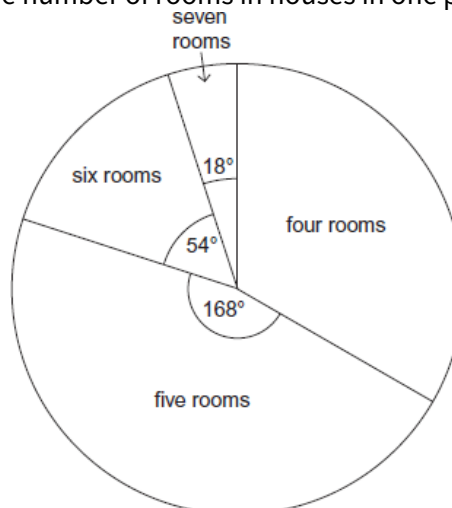
The pie chart shows information about the number of magazines sold in four countries.



- (a) What percentage of the total were sold in Scotland? (2)
- (b) Make **one** comparison of the sales in England with the sales in the other countries. (1)
- (c) 30 000 magazines were sold in Wales.
How many magazines were sold in total? (3)
- (Total 6 marks)**

Q8.

The pie chart represents the number of rooms in houses in one part of Manchester.



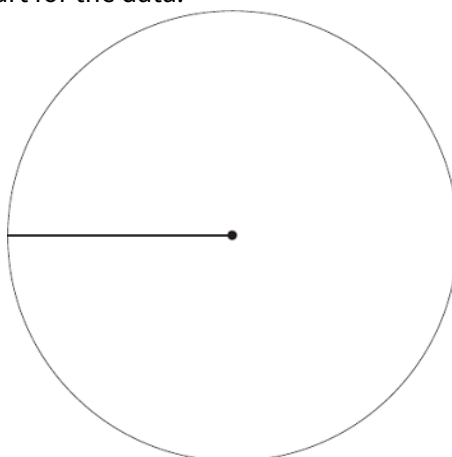
- (a) What fraction of these houses have seven rooms?
Give your answer in its simplest form. (2)
- (b) The number of houses with four rooms is 940.
How many houses does the whole pie chart represent? (3)
- (Total 5 marks)**

Q9.

The table shows where 72 people went on holiday.

Spain	36	
Portugal	18	
Turkey	6	
Other	12	
Total = 72		

Draw a fully labelled pie chart for the data.

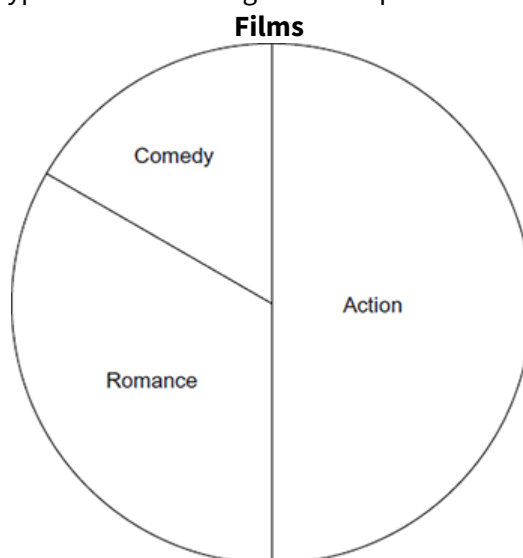


(Total 4 marks)

Q10.

You will need a protractor to answer this question.

The pie chart shows the types of film showing at a multiplex cinema.



There are 3 comedy films.

(a) How many films are showing altogether?

(3)

(b) How many **more** romance films are showing than comedy films?

(2)

(Total 5 marks)

Q11.

A car park is open from 9 am to 6 pm.

- (a) (i) 80 cars enter between 9 am and 10 am.

One-quarter of these cars are silver.

How many silver cars enter between 9 am and 10 am?

(1)

- (ii) 115 cars enter between 10 am and 11 am.

Kim says, "Exactly one-quarter of these cars are silver."

Show that she is wrong.

(1)

- (b) A data logging machine counts cars entering and leaving the car park.

Hour ending at	Cars entering	Cars leaving
10 am	80	5
11 am	115	25
12 noon	75	40
1 pm	35	35
2 pm	50	50
3 pm	40	45
4 pm	20	65
5 pm	10	115
6 pm	5	30

- (i) The car park is empty at 9 am.

How many cars are in the car park at 10 am?

(1)

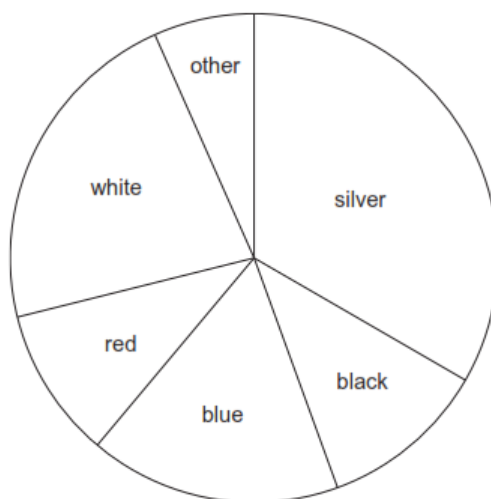
- (ii) Barriers stop cars entering when the car park is full.

The car park is full at 12 noon.

How many cars are in the car park when it is full?

(3)

- (c) The pie chart shows information about the colours of the cars in the car park one day.



Complete the sentences.

- (i) There are twice as many _____ cars as black cars.

(1)

- (ii) $\frac{1}{3}$ of the cars are _____

(1)

(d) Are there any purple cars in the car park on that day?

Tick a box.

☐

Yes

☐

No

☐

Cannot tell

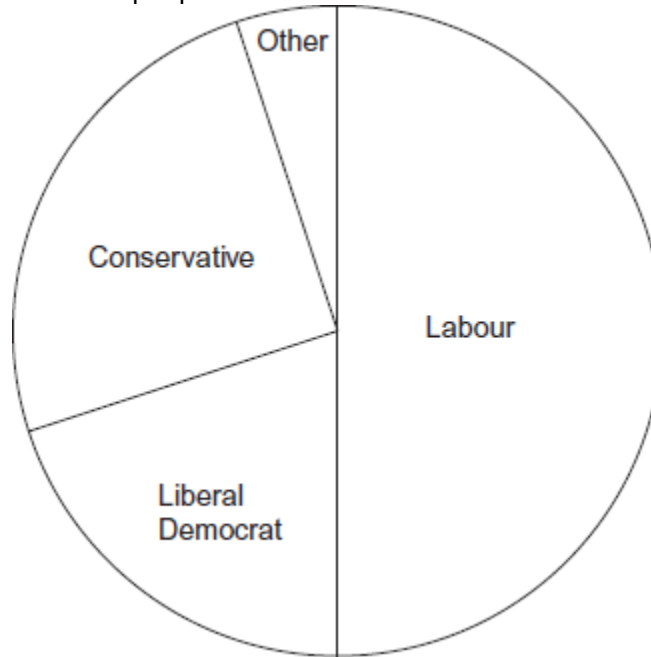
Give a reason for your answer.

(1)

(Total 9 marks)

Q12.

The pie chart shows how 120 people voted.



(a) How many people voted Labour?

(2)

(b) What **percentage** of people voted Liberal Democrat?

(3)

(Total 5 marks)

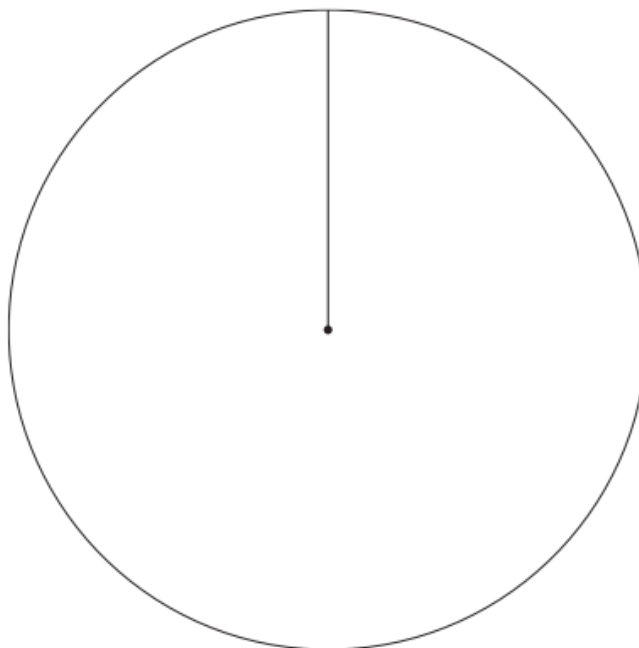
Q13.

Ian sells cans of drinks.

(a) The table shows the percentages of drinks sold on Monday morning.

Drink	Percentage Sold
Cola	30%
Lemonade	20%
Orange	50%

Draw a pie chart for the data.



(4)

(b) The pictogram shows information about the drinks sold on Monday afternoon.
The key is missing.

Cola	    
Lemonade	 
Orange	  

80 cans were sold that afternoon.

How many cans of cola were sold?

(3)

(c) 80 cans were also sold in the morning.

(i) Write down **one** difference between the cans sold in the morning and in the afternoon.

(1)

(ii) Ian orders more cans.

Which flavour should he order least of, based on Monday's sales?

Circle your answer.

Cola

Lemonade

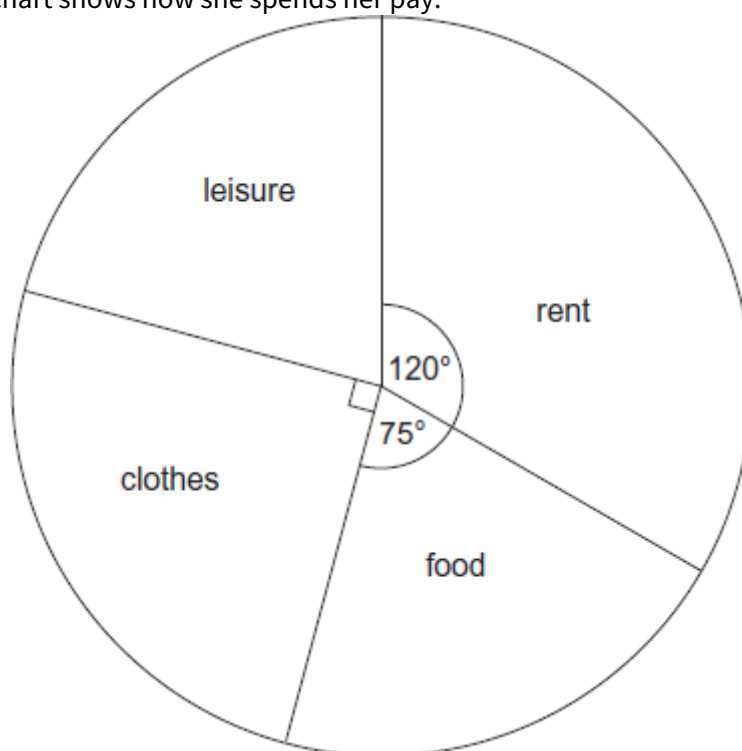
Orange

(1)

(Total 9 marks)

Q14.

- (a) Kate is paid £ 240 a week.
The pie chart shows how she spends her pay.

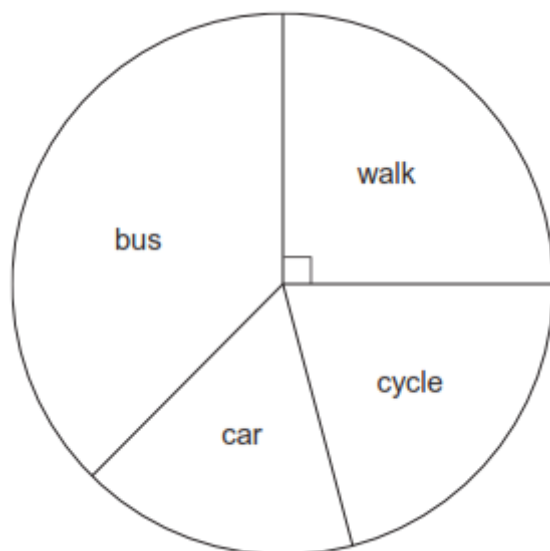


- (i) Which **two** items does Kate spend the same amount on? (1)
- (ii) What fraction of her pay does Kate spend on clothes? (1)
- (b) Liam is also paid £ 240 a week.
- (i) He spends $\frac{3}{10}$ of his pay on leisure.
How much does he spend on leisure each week? (2)
- (ii) Liam saves 15% of his pay.
How much does he save each week? (2)
- (c) Liam spends £ 86 on rent each week.
How much more than Kate does Liam spend on rent? (3)

(Total 9 marks)

Q15.

The pie chart shows information about how year 10 students travel to a school.



- (a) A student from year 10 is chosen at random.
Mark, with the letter, the probabilities of each of the following on the scale below.
The first one has been done for you.
- A:** The student walks to school.
 - B:** The student does **not** walk to school.
 - C:** The student travels to school by train.



- (b) 40 students travel to school by car.
How many year 10 students are there?
- (c) There are 252 students in year 11.
The same proportion of students walk to school as in year 10.
Work out the number of year 11 students that walk to school.

(2)

(3)

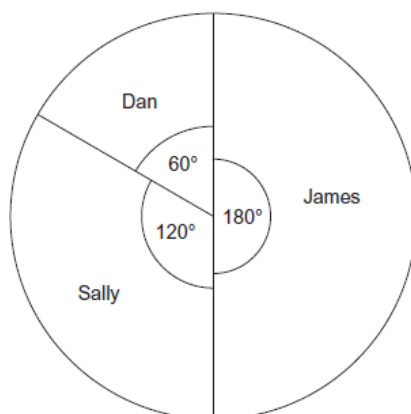
(2)

(Total 7 marks)

Q16.

Three singers took part in a TV contest. 3 000 000 people voted by telephone.

Telephone votes



(a) How many telephone votes did James get?

(2)

(b) The table shows the Internet votes for each singer.

Internet votes	
James	800 000
Sally	1 450 000
Dan	150 000

The telephone votes and the Internet votes are added together for each singer.

Who got the most votes?

You **must** show your working.

(3)

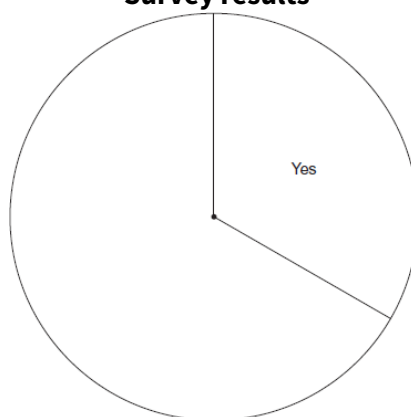
(Total 5 marks)

Q17.

A reporter asked people if they agreed with a government policy.

$\frac{1}{3}$ said Yes, $\frac{2}{5}$ said No and the rest said Don't Know

Survey results



Complete the pie chart.

(Total 3 marks)

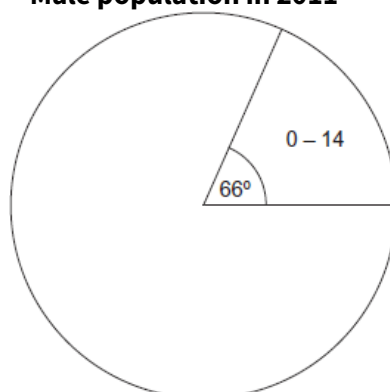
Q18.

In 2011 there were 3.22×10^7 females in the UK.

This was 51% of the whole population.

The pie chart shows an estimate of the males aged 0 – 14 years old in 2011.

Male population in 2011



Source: <http://www.ons.gov.uk>

Use this information to work out the number of males aged 0 – 14 years old in 2011.

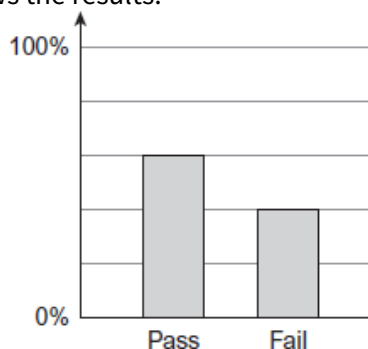
Write your answer in standard form.

(Total 6 marks)

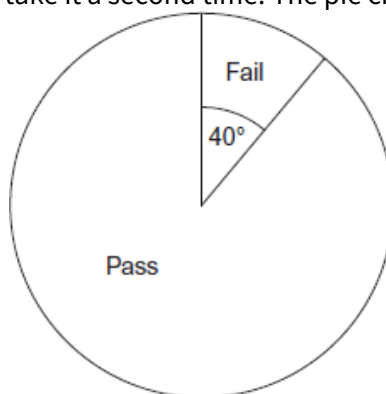
Q19.

Some students take a cycling test.

The percentage bar chart shows the results.



The students who fail the test take it a second time. The pie chart shows the results.



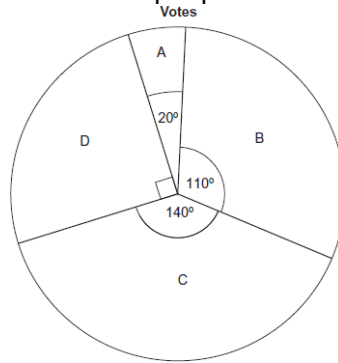
Two students fail the second test.

How many students pass the test first time?

(Total 5 marks)

Q20.

The pie chart shows information about how people voted in an election.



1800 people voted for D.

How many **more** people voted for C than B?

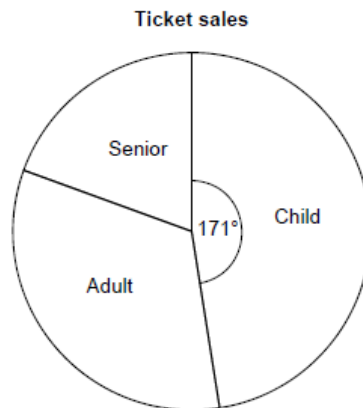
(Total 3 marks)

Q21.

The pie chart shows information about the sales of 800 tickets.

There were twice as many adult ticket sales as senior ticket sales.

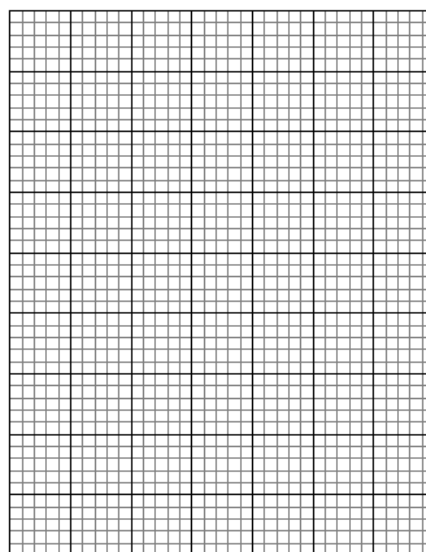
Not drawn accurately



(a) Show that there were 140 senior ticket sales.

(b) Draw a bar chart on the grid to represent the child, adult and senior ticket sales.

Ticket sales

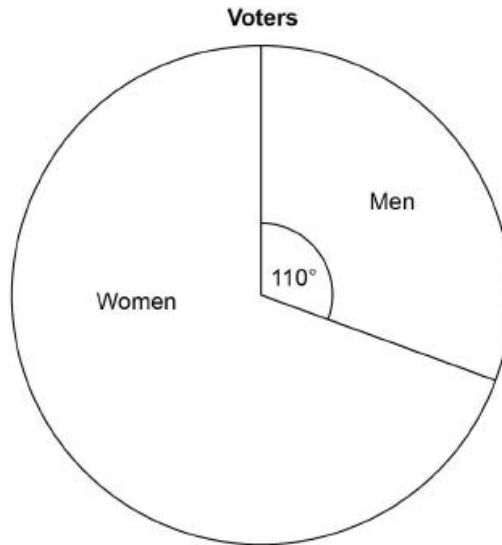


(4)

(Total 7 marks)

Q22.

The pie chart shows information about voters in an election.



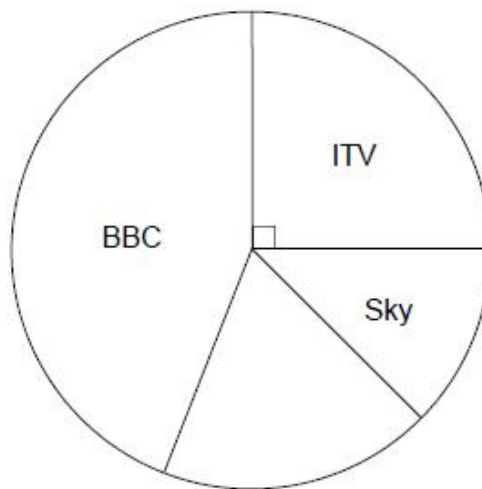
3360 **more** women voted than men.
Work out the total number of voters.

(Total 3 marks)

Q23.

Jack draws a pie chart to represent his time watching the news in January.
Altogether he watches 18 hours of news.

Time watching the news



(a) How many hours did he spend watching ITV news?

(2)

(b) Write down **one** criticism of his pie chart.

(1)

(c) In February he also watches 18 hours of news.

He watches 10 hours on the BBC.

Jack says,

“This is more than in January because the pie chart shows I watched less than 9 hours of BBC news.”

Comment on his statement.

(1)

- (d) In February he watches 2 hours of news on Sky.

Jack says,

“If I draw a pie chart for February the angle for Sky news will **not** be a whole

number of degrees. This is because $\frac{2}{18}$ is **not** a terminating decimal.”

Is his statement correct?

Tick a box.

☐

Correct

☐

Not correct

You **must** show your working.

(2)

(Total 6 marks)

Q24.

In a pie chart, one sector represents $\frac{1}{4}$ of the data.

What is the angle of that sector?

Circle your answer.

4°

25°

45°

90°

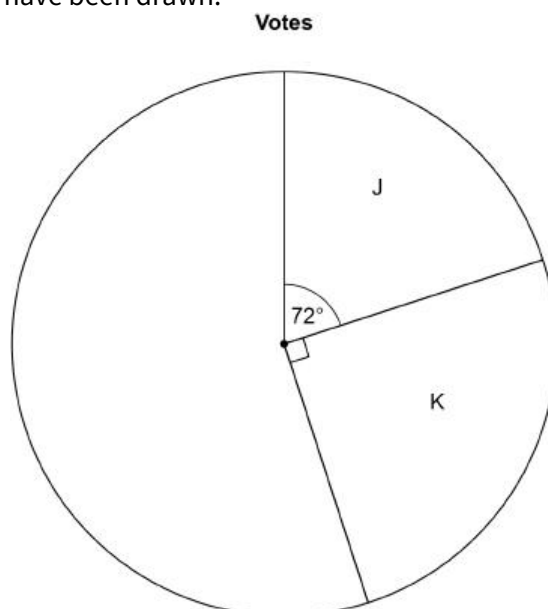
(Total 1 mark)

Q25.

In an election there were four candidates, J, K, L and M.

Fran is drawing a pie chart to show the results.

The sectors for J and K have been drawn.



- (a) Twice as many people voted for L as voted for M.
Complete the pie chart.

(3)

- (b) Altogether, 16 200 people voted.
How many voted for J?

(2)

(Total 5 marks)

Q26.

A shop sells ice creams.
Each ice cream has two scoops.



The possible flavours are vanilla (V), strawberry (S), chocolate (C) and mint (M).
The two scoops can be the same flavour or different flavours.

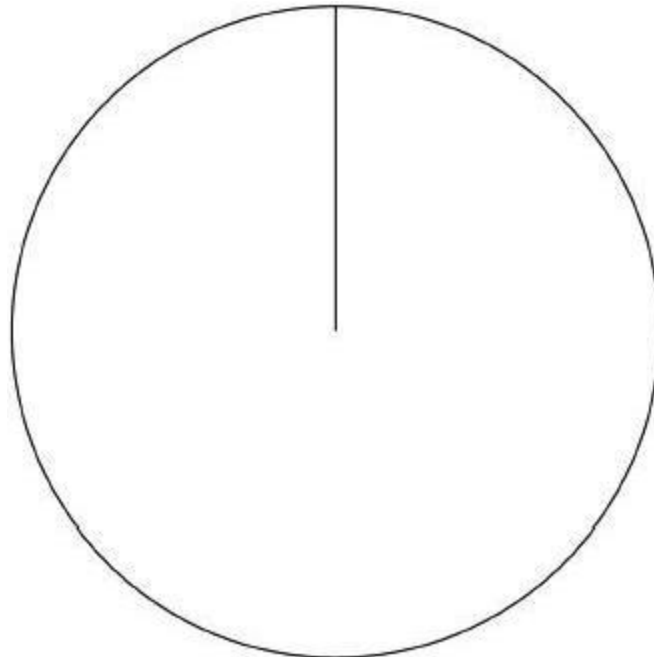
(a) List **all** the possible options for the two scoops.

(2)

(b) In one hour the shop sells 180 scoops of ice cream.
The number of scoops of each flavour is shown in the table.

Flavour	Vanilla	Strawberry	Chocolate	Mint
Number of scoops	45	75	50	10

Complete the pie chart to represent the data.



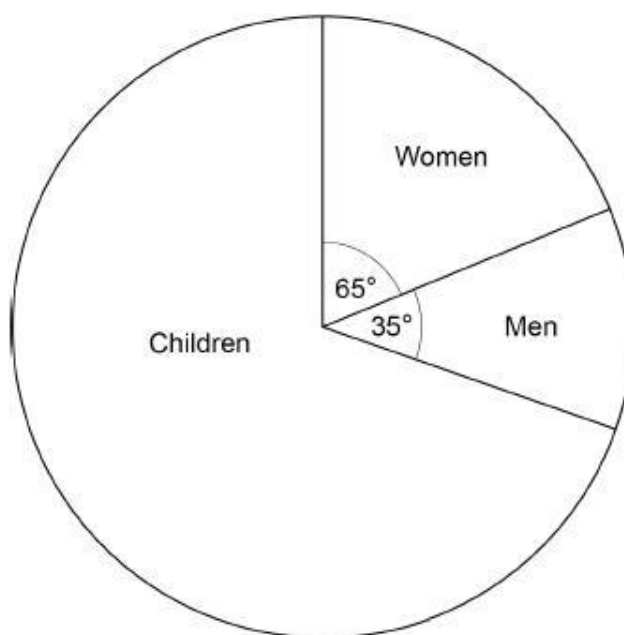
(4)

(Total 6 marks)

Q27.

The pie chart shows information about people at a theme park.

Not drawn accurately

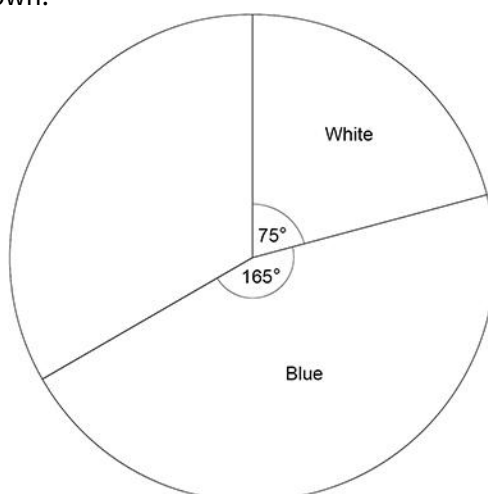


There were 450 **more** women than men.
Work out the number of children.

(Total 3 marks)

Q28.

Some players were asked the shirt colour of their football team.
Each answer was either White, Blue, Red or Green.
A pie chart is drawn to represent the answers.
Two of the sectors are shown.



- (a) The number who answered Red is three times the number who answered Green.
Complete the pie chart.

(3)

- (b) There were 600 players altogether.
How many players answered White?

(2)

(Total 5 marks)

Q29.

Ronnie draws a pie chart to represent the amount of time he spent watching TV in December.

Altogether, he watched 90 hours of TV.



- (a) How many hours did he spend watching sport?

(2)

- (b) Write down **one** way in which his pie chart could be improved?

(1)

- (c) In January he also watched 90 hours of TV.

He watched 50 hours of documentaries.

Ronnie says,

“This was more than in December because the pie chart showed I watched less than 45 hours of documentaries.”

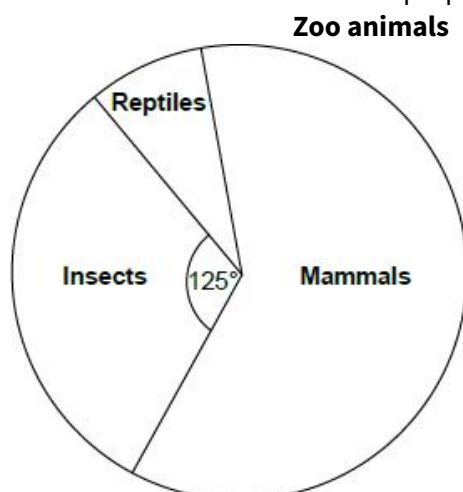
Comment on his claim.

(1)

(Total 4 marks)

Q30.

The pie chart shows some information about the proportion of animals in a zoo.



Not drawn accurately

The angle for mammals is 175° more than the angle for reptiles.

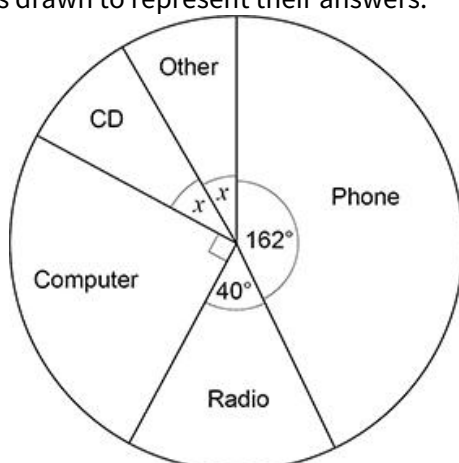
There are 4680 animals in total.

Work out the number of mammals in the zoo.

(Total 4 marks)

Q31.

Some people were asked for the main way they listen to music.
A pie chart is drawn to represent their answers.



Not drawn
accurately

- (a) Work out the size of angle x .
- (b) 135 people said Computer.
How many people said Phone?

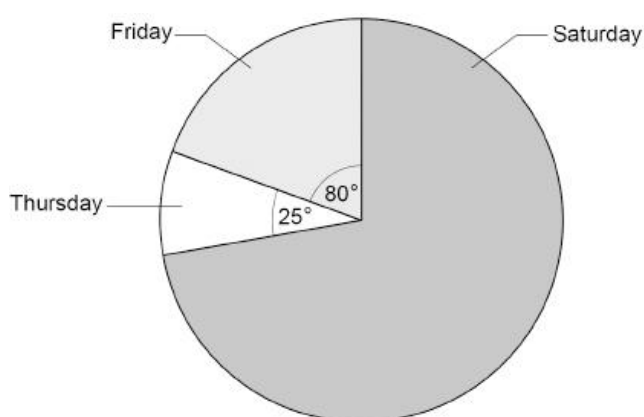
(2)

(3)

(Total 5 marks)

Q32.

The pie chart shows information about people at a fair during three days.



Not drawn
accurately

There were 132 **more** people on Friday than on Thursday.
Work out the number of people on Saturday.

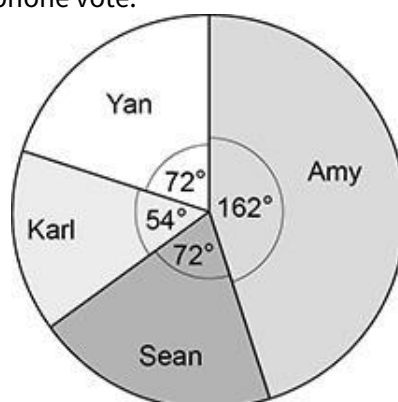
(Total 3 marks)

Q33.

Four people are taking part in a television talent show.
Here are Amy's marks from the 6 judges.

8	9	9	6	9	10
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The pie chart represents the phone vote.



Amy's total score is found by

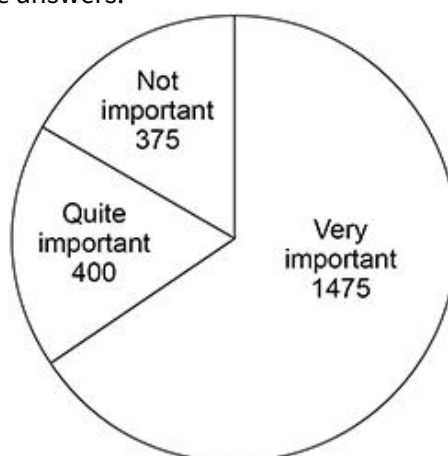
$4 \times \text{the mean of her marks}$ $+$ $\text{her percentage of the phone vote}$

Work out Amy's total score.

(Total 4 marks)

Q34.

A survey was held in a football stadium.
A sample of the crowd was asked about the importance of a family area.
The pie chart represents the answers.



- (a) The total number of people in the crowd was 29 250
Estimate how many people in the crowd think that a family area is **very important**.
Assume that the sample is representative of the crowd.

(3)

- (b) In fact,
 50% of the **sample** were sitting in the family area
 10% of the **crowd** were sitting in the family area.
 What is this likely to mean about the actual number of people in the crowd who think that a family area is very important?
 Tick **one** box.

☐
☐
☐

It is larger than the answer to part (a)

It is the same as the answer to part (a)

It is lower than the answer to part (a)

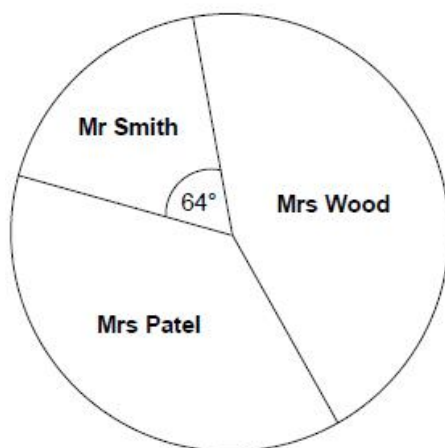
(1)
 (Total 4 marks)

Q35.

The pie chart shows some information about the share of votes for candidates in an election.

Election Results

Not drawn accurately



The angle for Mrs Wood would be 24° more than the angle for Mrs Patel.
 There were 5220 votes in total.
 Work out the number of votes for Mrs Patel.

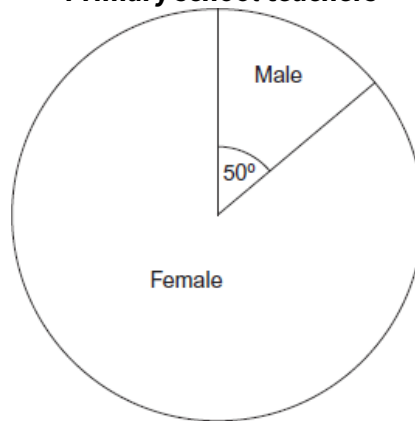
(Total 4 marks)

Question 37 is **higher** tier only

Q36.

The pie chart shows the proportion of male and female teachers in 15 074 schools.

Primary school teachers



The mean number of teachers per school is 13.7

Work out the total number of **female** teachers in these schools.

Give your answer to 2 significant figures.

(Total 5 marks)