

Pie Charts

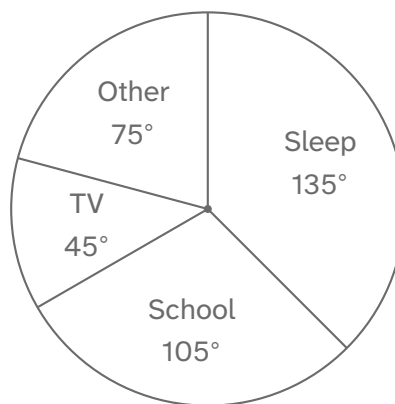
Solutions

For Pearson Edexcel GCSE Mathematics (1MA1) • Foundation tier

Each question is shown in grey, followed by the working, one step per line. The final answer is in a box. *Marks* shows how the marks are usually given in the exam, and **Tip** points out a common mistake.

1 (3 marks)

The accurate pie chart shows how Sam spent one day (24 hours).



(a) How many hours did Sam spend sleeping?

The angle for sleep is 135° .

The whole circle, 360° , is 24 hours.

$$\frac{135}{360} \times 24 = 9$$

Answer: 9

Marks: 1 mark for $\frac{135}{360} \times 24$ (or $360 \div 24 = 15^\circ$ per hour). 1 mark for 9.

(b) What fraction of the day did Sam spend watching TV?

Give your answer in its simplest form.

The angle for TV is 45° out of 360° .

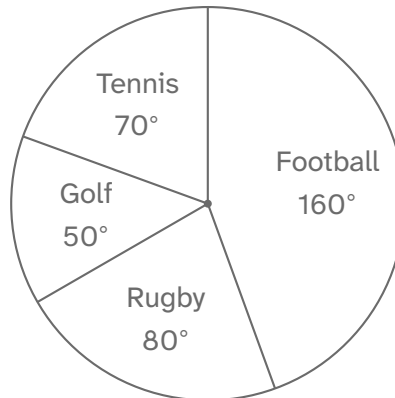
$$\text{Fraction} = \frac{45}{360}$$

Divide top and bottom by 45: $\frac{45}{360} = \frac{1}{8}$

Answer: $\frac{1}{8}$

2 (3 marks)

The pie chart gives information about the favourite sport of 180 people.



(a) Work out the number of people who chose rugby.

The angle for rugby is 80° .

360° represents 180 people, so 1 person is 2° .

$$80 \div 2 = 40$$

Answer: 40

Marks: 1 mark for $\frac{80}{360} \times 180$ or $80 \div 2$. 1 mark for 40.

(b) What fraction of the people chose football?
Give your answer in its simplest form.

The angle for football is 160° out of 360° .

$$\text{Fraction} = \frac{160}{360}$$

Divide top and bottom by 40: $\frac{160}{360} = \frac{4}{9}$

Answer: $\frac{4}{9}$

3 (4 marks)

The table gives information about the favourite colour of 60 people.

Colour	Blue	Red	Green	Yellow
Frequency	17	11	20	12

Draw an accurate pie chart for this information.

60 people share 360° .

$360 \div 60 = 6^\circ$ per person

Blue: $17 \times 6 = 102^\circ$

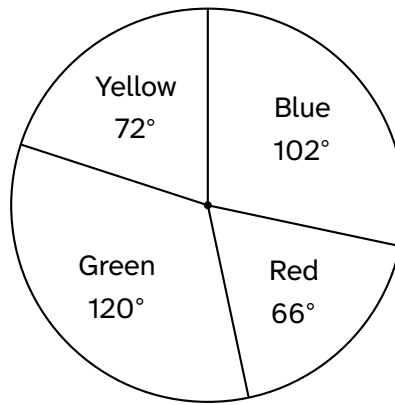
Red: $11 \times 6 = 66^\circ$

Green: $20 \times 6 = 120^\circ$

Yellow: $12 \times 6 = 72^\circ$

Check: $102 + 66 + 120 + 72 = 360^\circ$ ✓

Draw each angle with a protractor and label each sector.



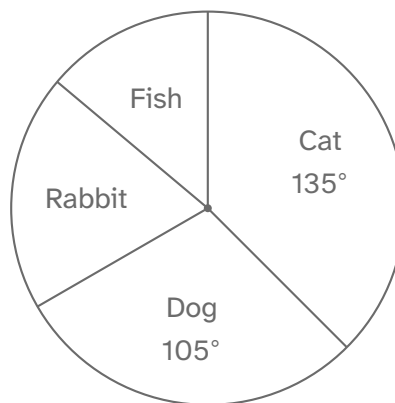
Answer: Angles 102, 66, 120, 72

Tip: The frequencies are not the angles. Multiply each one by 6° first. Label the sectors with the colours, not the angles.

Marks: 1 mark for $360 \div 60$. 1 mark for all four angles. 1 mark for drawing them accurately. 1 mark for labelling the sectors.

4 (3 marks)

The pie chart shows information about the pets owned by some people.



45 people own a cat.

Work out the number of people who own a dog.

135° represents 45 people.

$135 \div 45 = 3$, so 1 person is 3°.

The angle for dog is 105°.

$$105 \div 3 = 35 \text{ people}$$

Answer: 35

Tip: You don't know the total number of people here, so don't use 360. Find the angle for one person instead.

Marks: 1 mark for $135 \div 45 = 3$. 1 mark for $105 \div 3$. 1 mark for 35.

5 (4 marks)

The table shows the after-school club chosen by each of 90 students in Year 8.

Club	Art	Drama	Chess
Number of students	30	35	25

(a) Complete the accurate pie chart to show this information.

90 students share 360° .

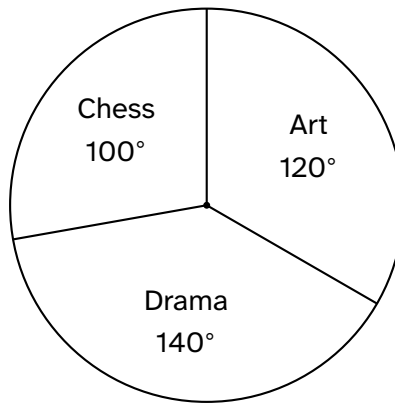
$$360 \div 90 = 4^\circ \text{ per student}$$

$$\text{Art: } 30 \times 4 = 120^\circ \text{ (already drawn)}$$

$$\text{Drama: } 35 \times 4 = 140^\circ$$

$$\text{Chess: } 25 \times 4 = 100^\circ$$

$$\text{Check: } 120 + 140 + 100 = 360^\circ \quad \checkmark$$



Answer: Drama 140° , Chess 100°

Marks: 1 mark for $360 \div 90 = 4$ (or $\frac{35}{90} \times 360$). 1 mark for 140° and 100° . 1 mark for a fully correct, labelled pie chart.

(b) Ben says,

“The angle for Chess should be 25° because 25 students chose Chess.”

Explain what is wrong with what Ben says.

The pie chart shows 90 students, not 360.

So each student is worth $360 \div 90 = 4^\circ$, not 1° .

The angle for Chess is $25 \times 4 = 100^\circ$.

Answer: Each student is 4° (not 1°), so Chess is 100°

Tip: One person is worth 1° only when there are exactly 360 people. Work out $360 \div$ total first.

6 (4 marks)

A zoo sells adult, child and senior tickets.

The table shows the numbers of tickets sold on Saturday.

Ticket	Adult	Child	Senior
Number sold	210	190	100

The pie chart shows information about the 600 tickets sold on Sunday.

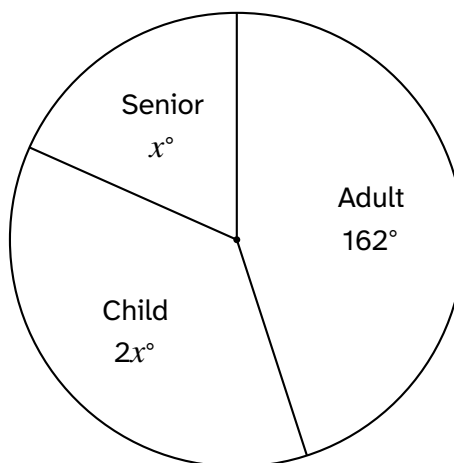


Diagram **NOT** accurately drawn

Alfie says,

“Fewer senior tickets were sold on Sunday than on Saturday.”

Is Alfie correct?

You must show how you get your answer.

Sunday: the angles add up to 360° .

$$162 + 2x + x = 360, \text{ so } 3x = 198 \text{ and } x = 66$$

$$\text{Senior tickets on Sunday: } \frac{66}{360} \times 600 = 110$$

Senior tickets on Saturday: 100 (from the table)

$110 > 100$, so more senior tickets were sold on Sunday.

Alfie is not correct.

Answer: No: 110 on Sunday, 100 on Saturday

Tip: The angles are not the number of tickets. Find x first, then change the angle into a number of tickets using the total of 600.

Marks: 1 mark for $x = 66$. 1 mark for $\frac{66}{360} \times 600$. 1 mark for 110. 1 mark for the conclusion with 110 and 100 compared.
