# Comparative pie charts

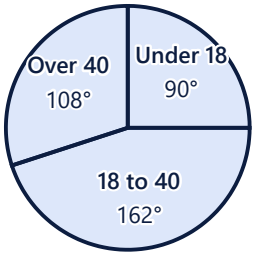
Grade 6 | Worked solutions

**GCSE Statistics topic practice**

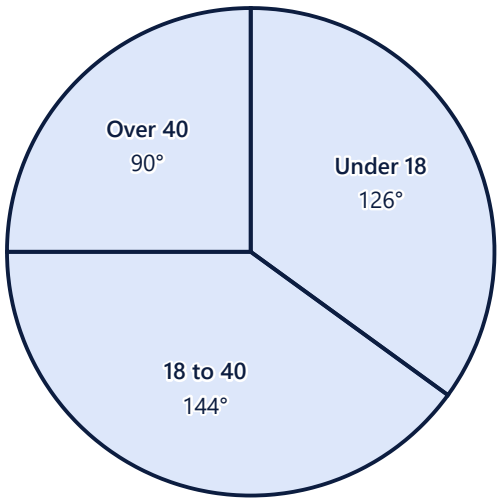
**1** The comparative pie charts show the ages of the members of a climbing club in 2010 and in 2020.

a. The pie chart for 2020 has a larger area than the pie chart for 2010. What does this show? (1)

b. Work out how many more members aged under 18 the club had in 2020 than in 2010. (2)




**2010: 100 members**




**2020: 400 members**

Diagram NOT accurately drawn

(3 marks)

a)

The area of each chart shows the total.

There were more members in 2020.

b)

$$2010 \text{ under } 18 = \frac{90}{360} \times 100$$

$$= 25$$

$$2020 \text{ under } 18 = \frac{126}{360} \times 400$$

$$= 140$$

$$140 - 25 = 115$$

a) more members in 2020 b) 115 more


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**2** Rina is drawing comparative pie charts for the number of students at her college. In 2019 there were 320 students. In 2024 there were 500 students.

Rina draws the pie chart for 2019 with a radius of 4 cm. She then works out 500 ÷ 320 × 4 = 6.25 and draws the pie chart for 2024 with a radius of 6.25 cm.

a. Explain what is wrong with Rina's method. (1)

b. Work out the correct radius for the pie chart for 2024. (2)

(3 marks)

a)

The areas must be in the same ratio as the totals, not the radii.

Her 2024 chart is too big.

b)

500 ÷ 320 = 1.5625

Square root for the radius scale factor

$\sqrt{1.5625} = 1.25$

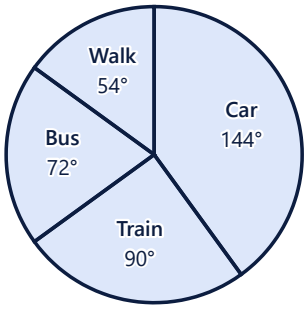
4 × 1.25 = 5

a) areas, not radii, match the totals b) 5 cm

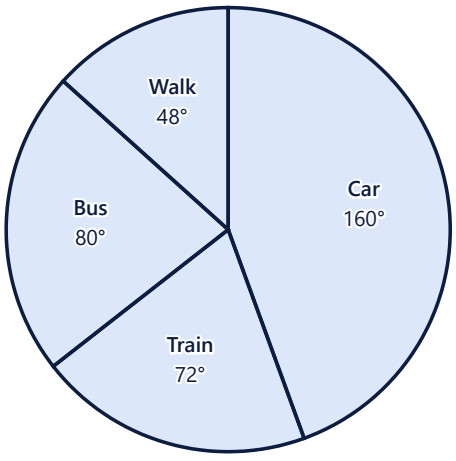
**3** The comparative pie charts show how visitors travelled to a music festival in 2015 and in 2025. There were 200 visitors in 2015 and 450 visitors in 2025. The pie chart for 2015 has a radius of 3 cm.

a. Work out the radius of the pie chart for 2025. (2)

b. Tariq says, "The angle for Train is smaller in 2025, so fewer visitors travelled by train in 2025 than in 2015." Is Tariq correct? You must show your working. (2)




**2015: 200 visitors**




**2025: 450 visitors**

Diagram NOT accurately drawn

(4 marks)

a)

The areas are in the same ratio as the totals

450 ÷ 200 = 2.25


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Square root for the radius scale factor

$\sqrt{2.25} = 1.5$

$3 \times 1.5 = 4.5$

b)

Find the train visitors in 2015, then in 2025

$\frac{90}{360} \times 200 = 50$

$\frac{72}{360} \times 450 = 90$

$90 > 50$ so more visitors used the train in 2025.

Tariq is not correct.

**a) 4.5 cm b) no, 50 in 2015 and 90 in 2025**

**4** A charity is drawing comparative pie charts to show where its income came from in 2015 and in 2025. The pie chart for 2015 has been drawn with a radius of 2 cm. The total income in 2015 was £80 000.

The table shows the income in 2025.

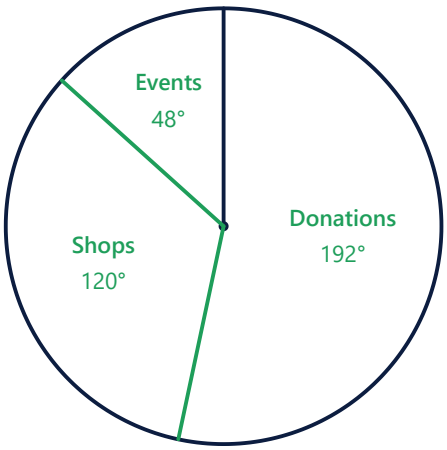
| Source of income | Donations | Shops | Events |
|---|---|---|---|
| **Income in 2025** | £96 000 | £60 000 | £24 000 |

a. Show that the pie chart for 2025 should have a radius of 3 cm. (2)

b. The circle for 2025 has been drawn for you. Complete the pie chart for 2025. (3)




**2015: £80 000**




**2025**

(5 marks)

a)

$96\,000 + 60\,000 + 24\,000 = 180\,000$

$180\,000 \div 80\,000 = 2.25$

Square root for the radius scale factor


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$$\sqrt{2.25} = 1.5$$

$$2 \times 1.5 = 3$$

b)

Work in thousands of pounds

$360 \div 180 = 2$

So each £1000 is 2 degrees

$$\text{Donations} = 96 \times 2$$
$$= 192$$
$$\text{Shops} = 60 \times 2$$
$$= 120$$
$$\text{Events} = 24 \times 2$$
$$= 48$$

Check

$192 + 120 + 48 = 360$

Measure each angle with a protractor.

Label each sector.

a) $2 \times 1.5 = 3$ cm b) 192, 120 and 48 degrees

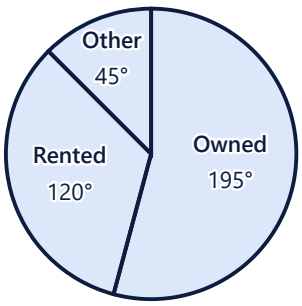

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**5** The comparative pie charts show whether the households in two towns own their home, rent their home or have some other arrangement. There are 240 households in the survey for Town A. The pie chart for Town A has a radius of 2 cm and the pie chart for Town B has a radius of 3 cm.

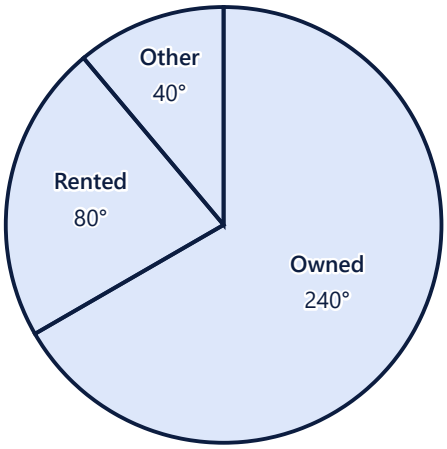
a. Work out the number of households in the survey for Town B. (2)

b. Sofia says, "The Rented sector is bigger for Town A, so more households rent in Town A than in Town B." Is Sofia correct? You must show your working. (2)

c. Compare the proportion of households that rent in Town A with the proportion that rent in Town B. (1)




**Town A: 240 households**




**Town B**

Diagram NOT accurately drawn

(5 marks)

a)

Radius scale factor = $3 \div 2$

= 1.5

Square it for the area scale factor

$1.5^2 = 2.25$

$240 \times 2.25 = 540$

b)

Town A rented = $\frac{120}{360} \times 240$

= 80

Town B rented = $\frac{80}{360} \times 540$

= 120

120 > 80 so more households rent in Town B.

Sofia is not correct.


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c)

The Rented angle is bigger for Town A,

120 degrees > 80 degrees

A greater proportion rent in Town A.

a) 540 b) no, 80 in A and 120 in B c) greater in A


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