

Relative sized pie charts

Year 7 About 70 minutes Calculator allowed 53 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-relative-sized-pie-charts/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] **A2** Needed today [1 mark]
 Write the ratio 75 : 120 in its simplest form. Which number, multiplied by itself, gives 1.44?

Answer

Answer

- A3** Last lesson [1 mark] **A4** From chapter 8 [1 mark]
 A pie chart shows 240 pupils. The walk sector is 25%. How many pupils walk? Round 4.873 to 2 significant figures.

Answer

Answer

B Example, then your turn

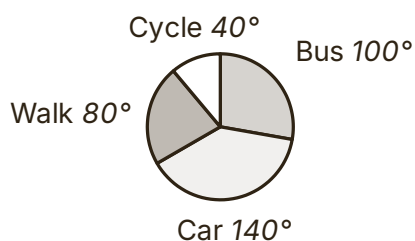
Year 7

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

The pie chart shows how 144 people travel to work.

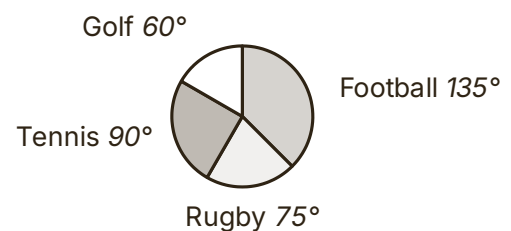
- (a) How many travel by car?
 (b) How many more people walk than cycle?



Hint The whole circle, 360° , is all 144 people. Find how many degrees stand for one person.

- B1** The pie chart shows the favourite sport of 240 people. [3 marks]

- (a) How many chose football?
 (b) How many more chose tennis than golf?



Answer (a) ... (b) ...

EXAMPLE 2

Pie charts are drawn for two schools. School P has 160 pupils and its pie chart has radius 4 cm. School Q has 360 pupils. Work out the radius of the pie chart for School Q.

Hint The areas must be in the ratio of the totals.
Simplify the ratio, then take the square root of each part to get the ratio of the radii.

B2 Shop A had 250 customers and [3 marks]
Shop B had 490. Shop A's pie chart has radius 5 cm. Work out the radius of Shop B's pie chart.

Answer ... cm

EXAMPLE 3

A pie chart for 120 pupils has radius 3 cm. Work out the radius of a pie chart for 300 pupils. Give your answer to 1 decimal place.

Hint Divide to find how many times bigger the second total is. The radius is multiplied by the square root of that.

B3 A pie chart for 180 people has [3 marks]
radius 4 cm. Work out the radius of a pie chart for 252 people. Give your answer to 1 decimal place.

Answer ... cm

EXAMPLE 4

Pie chart X has radius 6 cm and shows 540 kg of waste. Pie chart Y is drawn to the same scale with radius 4 cm. How much waste does pie chart Y show?

Hint Write the radii as a fraction, then square it: that is how the totals compare.

B4 Pie chart A has radius 5 cm [3 marks]
and shows 400 pupils. Pie chart B is drawn to the same scale with radius 3 cm. How many pupils does pie chart B show?

Answer

c Practice

Year 7

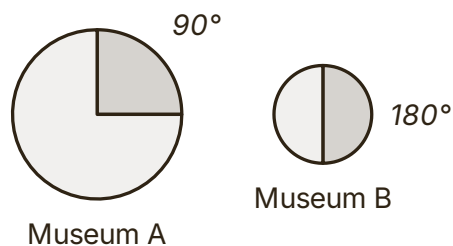
C1 Two pie charts are drawn to the [2 marks]
same scale. Their radii are 3 cm and 4 cm. Write the ratio of the totals they show.

Answer

C2 A café sold 48 drinks: 20 teas, 16 [3 marks]
coffees and 12 juices. Work out the angle of each sector of a pie chart.

Answer tea ...° , coffee ...° , juice ...°

- C3** Museum A had 360 visitors and Museum B had 120. The shaded sectors show the visitors from abroad. Which museum had more visitors from abroad, and how many more? [3 marks]



Answer

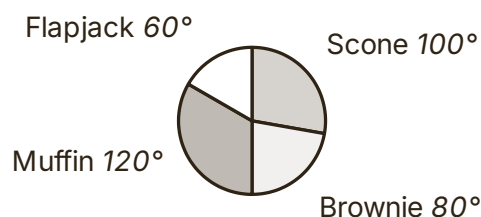
Answer Museum ... , by ...

D Exam-style questions

GCSE Foundation

- D1** On Saturday a café sold 216 cakes. The pie chart shows the cakes it sold.

- (a) How many muffins did the café sell? [2 marks]



Answer

- (b) On Sunday it sold 150 cakes. The Saturday pie chart has radius 6 cm. Work out the radius of a Sunday pie chart drawn to the same scale. [2 marks]

Answer ... cm

Total for D1: 4 marks

- D2** Ella says, "Club B's pie chart has twice the radius of Club A's, so Club B has twice as many members." [3 marks]

Club A has 45 members. Explain why Ella is wrong, and work out how many members Club B has.

Answer Club B has ... members

D3 The table shows how the pupils in a club travel to school.

- (a) Work out the angle for each sector of the 2022 pie chart. [2 marks]

Way to school	2022	2024
Walk	64	75
Bus	50	90
Car	30	60

Answer

- (b) The 2022 pie chart has radius 4 cm. Work out the radius of the 2024 pie chart. [2 marks]

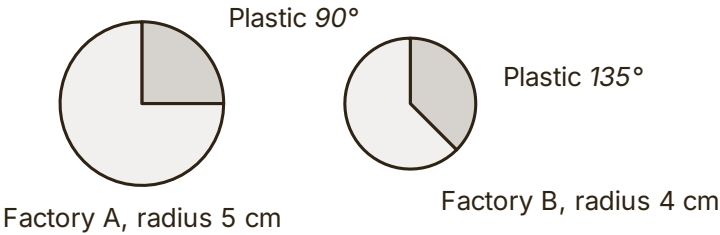
Answer ... cm

- (c) Work out the angle for each sector of the 2024 pie chart. [2 marks]

Answer

Total for D3: 6 marks

- D4** The pie charts show the waste from two factories, drawn to the same scale. [5 marks]
Factory A's chart shows 3600 kg of waste. Which factory had more plastic waste, and how much more? You must show your working.



Answer Factory ... , by ... kg

- D5** Shop P sold 320 pairs of shoes and Shop Q sold 450 pairs. Pie charts are drawn to the same scale. Shop P's pie chart has radius 4 cm.

- (a) Work out the radius of Shop Q's pie chart. Give your answer to 1 decimal place. [2 marks]

Answer ... cm

- (b) In Shop Q's pie chart the sector for trainers has an angle of 72°. How many pairs of trainers did Shop Q sell? [2 marks]

Answer

Total for D5: 4 marks

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** A pie chart of radius 6 cm shows all 360 members of a club. 160 of them are juniors and the rest are seniors. Two new pie charts are drawn to the same scale, one for juniors and one for seniors. Work out the radius of each new pie chart, to 1 decimal place where needed. Show that the two new pie charts together have the same area as the first one. [5 marks]

Answer juniors ... cm, seniors ... cm

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Compare each new total with 360, then take the square root to change the radius.
- Hint 2** Juniors: $\frac{160}{360} = \frac{4}{9}$, so the radius is $6 \times \frac{2}{3} = 4$ cm.
Seniors: $\frac{200}{360} = \frac{5}{9}$.
- Hint 3** Seniors: $6 \times \sqrt{\frac{5}{9}} = 4.47 \dots$ cm, about 4.5 cm. Areas:
 $\pi \times 16 + \pi \times 20 = 36\pi = \pi \times 6^2$.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

- I can read numbers from a pie chart using its angles. ☐ ☐ ☐
- I can work out the angles of a pie chart from a table. ☐ ☐ ☐
- I can work out the radius of a pie chart from its total. ☐ ☐ ☐
- I can compare two pie charts with different totals. ☐ ☐ ☐