Worksheet - Pie charts, line graphs and the mean

Year: Year 6 · 20

Show your working.

Question 1

Question 1 – Angles in a pie chart *(Section A · Skills practice)*

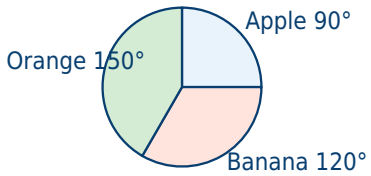
40 children chose their favourite sport and the results are going to be shown in a pie chart. 10 children chose football and 8 chose swimming.

a. What angle shows football in the pie chart?
b. What angle shows swimming?
c. A pie chart is drawn for a class of 24 pupils. How many degrees stand for one pupil?
d. In a pie chart for 60 pupils, one sector has an angle of 120°. How many pupils does it show?

Question 2

Question 2 – Reading a pie chart *(Section A · Skills practice)*

The pie chart shows the favourite fruit of 72 people.



a. Check that the angles add up to 360°.
b. How many people chose apple?
c. How many people chose banana?
d. How many people chose orange?
e. Which fruit was chosen by the most people, and how many more people chose it than chose apple?

Question 3

Question 3 – Drawing a pie chart *(Section A · Skills practice)*

30 pupils chose their favourite pet. The results are in the table.

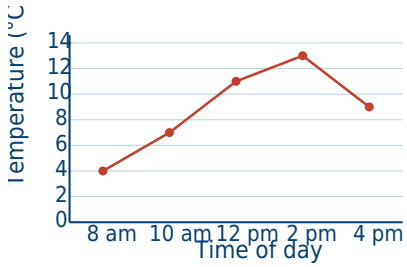
Pet	Cats	Dogs	Fish	Others
Number of pupils	12	9	6	3

a. How many degrees stand for each pupil?
b. Work out the angle for each pet.
c. Check that your angles add up to 360°.
d. What fraction of the pupils chose dogs? Give your answer in its simplest form.

Question 4

Question 4 – Reading a line graph *(Section A · Skills practice)*

The line graph shows the temperature on one day in spring.



a. At what time was it hottest, and what was the temperature?
b. By how much did the temperature rise between 8 am and 2 pm?
c. By how much did the temperature fall between 2 pm and 4 pm?
d. Estimate the temperature at 11 am. Explain why it is only an estimate.

Question 5

Question 5 – Finding the mean *(Section A · Skills practice)*

Find the mean of each set of numbers. Write down the total, then divide.

a. 4, 7, 9, 12
b. 15, 18, 21, 22, 24
c. 3.5, 4.5, 5, 7
d. Four pupils scored 12, 15, 9 and 14 in a quiz. What was the mean score?

Question 6

Question 6 – Using the mean to find missing values *(Section A · Skills practice)*

The mean tells us the total, so we can work backwards to find a missing value.

a. The mean of 5 numbers is 8. What is the total of the 5 numbers?
b. The mean of four numbers is 7. Three of the numbers are 5, 8 and 6. Find the fourth number.
c. Zoe played 3 games and her mean score was 18. She scored 15 in the first game and 20 in the second. What did she score in the third game?

d. The mean of 6 numbers is 140. What is their total?

Question 7

Question 7 – The school lunch survey *(Section B · Real-life practice)*

Mr Brown asks 90 pupils what they usually eat for lunch.

Lunch	Number of pupils
Sandwich	30
Pasta	25
Pizza	20
Salad	10
Soup	5

a. Check that the numbers add up to 90.
b. What angle stands for one pupil in a pie chart?
c. Work out the angle for each lunch.
d. Check that the angles add up to 360°.
e. What percentage of the pupils chose sandwiches? Give your answer to the nearest whole number.

Question 8

Question 8 – Rainfall in the town *(Section B · Real-life practice)*

The table shows the rainfall (in mm) in a town over six months.

Month	Jan	Feb	Mar	Apr	May	Jun
Rainfall (mm)	62	48	55	41	38	26

a. Which month had the most rain, and which had the least?
b. What was the total rainfall over the six months?
c. What was the mean monthly rainfall?
d. How many months had more rain than the mean?
e. The July rainfall is added to the data and the mean of seven months is 42 mm. What was the rainfall in July?

Question 9

Question 9 – Goals this season *(Section B · Real-life practice)*

A football team scores 2, 0, 3, 1 and 4 goals in its first five matches.

a. What is the mean number of goals per match?
b. The team plays a sixth match. After that match the mean is 2.5 goals. How many goals did the team score in the sixth match?

c. The team wants a mean of 3 goals after eight matches. What is the total number of goals needed?
d. How many goals must the team score in the last two matches to reach this mean, if it scores 15 goals in the first six?

Question 10

Question 10 – Pocket money *(Section B · Real-life practice)*

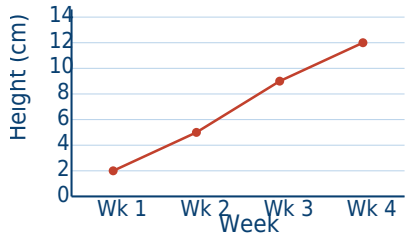
Five friends compare how much pocket money they get each week: Ana £4, Ben £6, Cara £5, Dev £8 and Ella £3.

a. Work out the mean pocket money.
b. Dev says "I get more than the mean". Is he right? By how much?
c. Frankie joins the group and gets £10 each week. Work out the new mean.
d. What would Frankie need to get each week to make the new mean exactly £6?

Question 11

Question 11 – Growing a bean plant *(Section B · Real-life practice)*

Leo measures a bean plant each week.

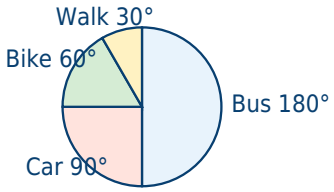


a. Write down the height of the plant in each week.
b. In which week did the plant grow the most? How much did it grow in that week?
c. What is the mean height over the four weeks?
d. Estimate the height of the plant halfway between week 2 and week 3.

Question 12

Question 12 – How pupils travel to school *(Section B · Real-life practice)*

120 pupils in Year 6 are asked how they travel to school. The pie chart angles are: bus 180°, car 90°, bike 60° and walk 30°.



a. Check that the angles add up to 360°.
b. How many pupils does each degree stand for?
c. How many pupils travel by each method?
d. What fraction of the pupils travel by car? What percentage is this?

Question 13

Question 13 – Test scores *(Section B · Real-life practice)*

Class 6A and Class 6B did the same maths test. Class 6A had 20 pupils and a mean score of 14. Class 6B had 30 pupils and a mean score of 12.

a. What was the total score for Class 6A?
b. What was the total score for Class 6B?
c. Work out the mean score of all 50 pupils in both classes together.
d. Why is the mean of all 50 pupils not exactly halfway between 14 and 12?

Question 14

Question 14 – The swimming practice *(Section B · Real-life practice)*

Hana swims 50 m five times in practice. Her times in seconds are 32.4, 31.8, 33.0, 32.1 and 31.7.

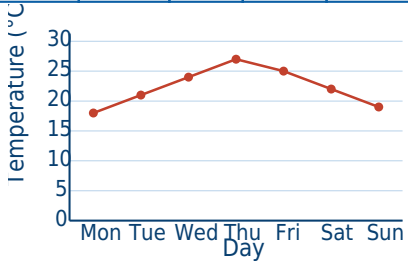
a. Work out her mean time.
b. What is the difference between her fastest and slowest times?
c. In the sixth practice she wants her mean to be 32 seconds. What time must she swim?
d. Round her mean time from part (a) to the nearest second.

Question 15

Question 15 – The holiday weather *(Section C · Problem solving)*

Ellie records the maximum temperature (in °C) each day on a week\'s holiday.

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Temperature	18	21	24	27	25	22	19



a. Which day was hottest? Which was coolest? What is the difference?
b. Work out the mean temperature for the week.
c. On how many days was the temperature above the mean?

d. What was the greatest rise in temperature from one day to the next, and between which days?
e. Ellie says "the temperature on Wednesday evening was probably 25°C". Explain why this is only an estimate.
f. On Monday of the next week the temperature is 20°C. What is the new mean for all 8 days, to 1 decimal place?

Question 16

Question 16 – The café *(Section C · Problem solving)*

A café sells 360 drinks one week. The pie chart angles are: tea 100°, coffee 150°, hot chocolate 60° and juice 50°. The café also records how many drinks it sold each day from Monday to Friday: 48, 55, 51, 62 and 44. It sells the rest of the drinks at the weekend.

a. How many drinks of each type did the café sell?
b. How many drinks did the café sell from Monday to Friday?
c. How many drinks were sold at the weekend?
d. What was the mean number of drinks sold per day on the weekdays?
e. The café sold the same number of drinks on Saturday as on Sunday. How many drinks were sold on Saturday?

Question 17

Question 17 – Same angle, different numbers *(Section C · Problem solving)*

Two classes each draw a pie chart of their favourite sport. In both charts, football has an angle of 120°. Class A has 30 pupils and Class B has 60 pupils.

a. How many pupils in each class chose football?
b. Ben says "the same number of pupils chose football in both classes because the angle is the same". Explain why he is wrong.
c. In Class B the angle for netball is 60°. How many pupils in Class B chose netball?
d. In Class A, 6 pupils chose netball. What is the angle for netball in the Class A chart?
e. Which class has the larger fraction of pupils who like netball? Show your working.

Question 18

Question 18 – The mean and the missing number *(Section C · Problem solving)*

Use the mean to solve these problems.

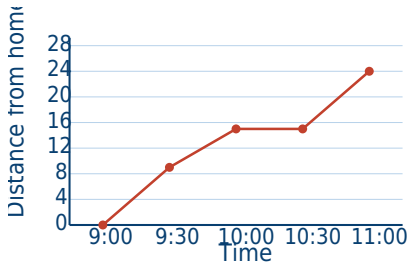
a. The mean of six numbers is 14. When one number is removed, the mean of the other five numbers is 13. What number was removed?
b. The mean of three numbers is 10. A fourth number is added and the mean becomes 12. What is the fourth number?

c. Five children have a mean age of 11. The ages of four of the children are 9, 10, 12 and 13. How old is the fifth child?
d. The mean of 8 numbers is 25. The mean of 5 of them is 20. What is the mean of the other 3 numbers?

Question 19

Question 19 – The cycle ride *(Section C · Problem solving)*

Jamal goes for a cycle ride. The line graph shows how far he is from home at different times.



a. How far from home was Jamal at 10:00?
b. What do you think Jamal did between 10:00 and 10:30? Explain how you know from the graph.
c. How far did he cycle between 10:30 and 11:00?
d. Work out his mean speed in km per hour between 9:00 and 11:00, ignoring the rest.
e. Jamal says "I cycled fastest between 10:30 and 11:00 only". Is he right? Check using the graph.

Question 20

Question 20 – Challenge: removing a number *(Section D · Challenge)*

The mean of five numbers is 12. One number is removed and the mean of the other four numbers is 11.

a. What number was removed?
b. The numbers were all different whole numbers. Write down one possible set of five numbers.
c. A sixth number is now added to the four remaining numbers. The mean of these five numbers is 13. What is the sixth number?