

🎯 Set 39

Interpreting Charts

These are the sections you must complete in this set:

- ✓ Topic Questions
- ✓ Problem Solving
- ✓ Challenge Questions

Types of charts

Many types of charts and graphs are used to represent statistical data. In previous sets we have seen line graphs, column and bar graphs and charts, dot plots and stem-and-leaf plots.

Some other types of charts and graphs that are used include:

- Pie charts
- Histograms which are similar to column graphs but do not have gaps between the columns
- Boxplots.

When interpreting charts and graphs, it is important to pay attention to:

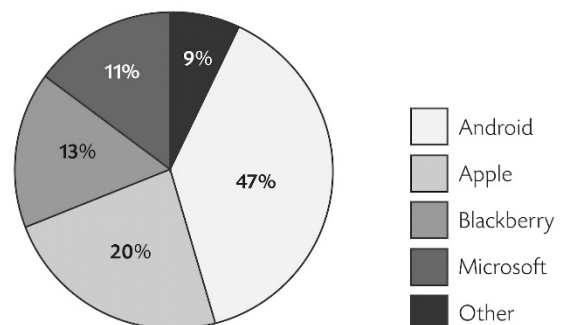
- The title which gives information about what the data relates to.
- If there is a vertical axis, this will represent the frequency of each value of the variable.
- If there is a horizontal axis, this will the values and scale of the variable being represented.

Remember that for the data being represented, it is often possible to analyse the data by calculating values for the mean, median, mode and range.

Example: This pie chart show the percentage of mobile sales in a particular year.

The percentages given are:

Android	47 %
Apple	20 %
Blackberry	13 %
Microsoft	11 %
Other	9 %



Topic Questions

The pie chart on the right shows my weekly exercise routine which totals $10\frac{1}{2}$ hours per week.

1. What is my most popular exercise ?

Answer: Walking

2. What percentage of my routine is playing basketball ?

Answer: 20 %

3. Which exercise do I spend the least time doing ?

Answer: Swimming and bowling

4. How many minutes do I spend on swimming per week ?

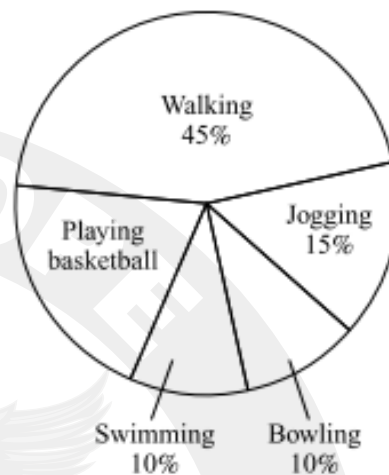
Answer: 63 minutes per week

5. How many minutes per week day do I spend on basketball, swimming and bowling ?

Answer: 252 minutes per week

6. How many minutes per day do I walk and jog for ?

Answer: 54 minutes per day



The histogram below shows the number of people who attended the local library last week.

The numbers are arranged according to age groups. 730 people attended in total.

7. What is the most popular age group ?

Answer: 40 to 50 years

8. What is the least popular age group ?

Answer: 80 to 90 years

9. Which is the median age group ?

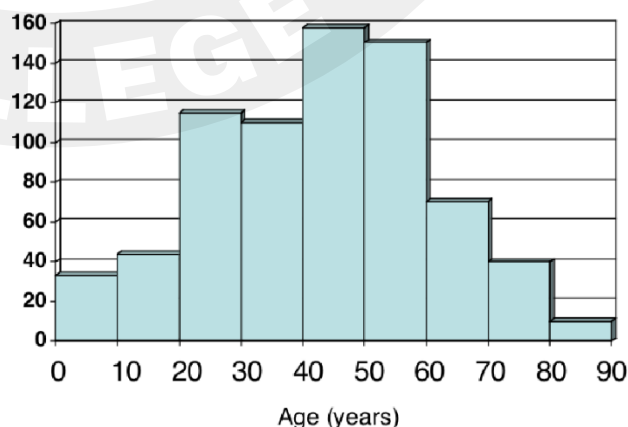
Answer: 60 to 70 years

10. How many in the 70 to 80 age group ?

Answer: 40

11. Approximately, how many under 20 attended the library ?

Answer: About 77



Problem Solving

1. Cindy likes to cook. A recipe states that for every litre of vinegar, 450 mL of water should be added. If she plans to use 720 mL of vinegar, how much water should she use ?

Answer: 324 mL

2. A piece of rope that is 96.64 metres long needs to be cut into 16 pieces of equal length. How long will each piece be ?

Answer: 6.04 metres

3. Find the next number in the sequence:

Answer: 126

2 6 14 30 62 ?

4. Andrew spent two-fifths of his savings on a new laptop computer. If the laptop cost \$1 720, how much did he have in his savings before he made the purchase ?

Answer: \$4 300

5. Find the smallest number that can be divided by 8, 12 and 15 without having a remainder.

Answer: 120

6. A dress, which normally costs \$199, is on sale for a 20% discount. If Amber has a voucher for \$60, how much will she need to pay in cash ?

Answer: \$99.20

7. Evaluate $\frac{7}{12} + \frac{1}{3} \left(2 - \frac{4}{5} \right)$

Answer: $\frac{59}{60}$

8. As part of his daily exercise, Peter runs 4 laps of a block around his house. If it takes him 17 minutes and 18 seconds to run one lap, how long does he spend running altogether ?

Answer: 1 hour 9 minutes and 12 seconds

Challenge Questions

1. How many decades are there from the year 728 BC to the year 1342 AD ?

Answer: 207 decades

2. Andrew has a birthday on 12 March and James has a birthday on 18 November. If both boys were born in the same year, how many days older is Andrew than James ?

Answer: 251 days

3. What is the date when the month of August is 20 000 minutes old ?

Answer: August 14

4. Jessica and Callum have to catch the 8.20 am train. Jessica's watch is 10 minutes fast, but she thinks that it is 5 minutes slow. Callum's watch is 10 minutes slow, but he thinks that it is 10 minutes fast. Each leaves home expecting to arrive at the station just in time to catch the train. Who misses the train and by how many minutes ?

Answer: Connor misses the train by 20 minutes

5. If Anna travels 700 metres in 3 minutes, what is her speed in km/h ?

Answer: 14 km/h

6. The petrol tank of a car can hold 60 litres of petrol. The car uses one litre of petrol for every 18 kilometres travelled. How much petrol is left in the tank after a trip of 225 kilometres if the petrol tank was three-quarters full at the start of the trip ?

Answer: 32.5 litres

7. Sprinter Usain Bolt ran 100 metres in 9.58 seconds. To the nearest whole number, calculate his average speed in km/h.

Answer: 38 km/h

Set 40

Rates and Ratios 2

These are the sections you must complete in this set:

- ✓ Topic Questions
- ✓ Problem Solving
- ✓ Challenge Questions

Revision of ratios

A **ratio** allows us to compare two or more amounts, measured in the same units, and shows the relative size of each quantity. Ratios must be given as **whole numbers** in simplest form. They are shown without units and can be stated using:

- The colon symbol, for example, “in the ratio 5 : 2”.
- The word “to”, for example, “in the ratio 5 is to 2”.

Example: Samuel gets \$18 pocket money each week and Lindy receives \$12.
State the ratio of Lindy’s pocket money to Samuel’s pocket money.
$$\text{Lindy : Samuel} = 12 : 18 = 2 : 3$$

Revision of rates

Rates are used to compare of two different quantities, expressing how one quantity changes with respect to another different quantity.

When describing a rate, the word “per” or the symbol “/” is used to separate the units of the two quantities used in the calculation, for example, kilometres per hour or litres / minute.

Example: James gets paid \$220 for working 8 hours. What is the rate per hour ?
$$\text{Rate} = \$220 \div 8 \text{ hours} = \$27.50 \text{ per hour.}$$

Example: A machine packs cans into boxes at a rate of 12 cans / minute.
How long will it take to pack 900 cans ?
$$\begin{aligned} \text{Time taken} &= 900 \div 12 \\ &= 75 \text{ minutes} \end{aligned}$$

Topic Questions

1. A woman buys 12 kg of potatoes at the market for \$39. What is the cost per kilogram ?

Answer: \$3.25 per kg

2. Calculate the following rates in simplest form:

(a) \$168 pay for 7 hours work (in \$/hour) **\$24 per hour**

(b) 250 g of sugar for 2 L of soft drink (in g/L) **125 g/L**

(c) Water leak of 1.25 mL every minute (in L/day) **1.8 L/day**

(d) 100 metres run in 12 seconds (in km/hour) **30 km/hour**

3. Complete the following equivalent ratios:

(a) $3 : 1 = 12 : ?$ **12 : 4** (b) $3 : 8 = 21 : ?$ **21 : 56**

(c) $3 : 11 = ? : 55$ **15 : 55** (d) $7 : 13 = ? : 65$ **35 : 65**

4. All scales on maps default to centimetres. Therefore a scale on a map of 1 : 5 000 indicates that 1 cm on the map has a real distance of 5 000 cm. Calculate, in metres, the real distance between two landmarks that are 23 cm apart on a map with the above scale.

Answer: 1 150 metres

5. In a school of 900 students, the ratio of girls to boys is 11 : 14. How many girls are there in the school ?

Answer: 396 girls

6. Simplify the following ratios:

(a) 17 : 85 **1 : 5** (b) 4.9 : 0.7 **7 : 1**

(c) 50c : \$7.50 **1 : 15** (d) 0.375 : 1 **3 : 8**

(e) 450 mL : 2 L **9 : 40** (f) 25 mm : 200 cm **1 : 80**

(g) 40 secs : 4 mins **1 : 6** (h) $\frac{2}{3} : \frac{3}{5}$ **10 : 9**

Problem Solving

1. In one day, 552 people visited Jamie's restaurant. If the restaurant was open from midday to midnight, what was the average number of customers per hour ?

Answer: 46 people per hour

2. The price of a bicycle is increased from \$420 to \$450. Find the ratio of the new price to the old price of the bicycle.

Answer: 15 : 14

3. Isabelle is told to take 15 mL of medicine every eight hours. If a full medicine bottle contains 350 mL, how much medicine will be remaining after one week ?

Answer: 35 mL remaining

4. Sandy gets paid \$20 per hour when working on weekdays and \$22.60 when working on weekends. If she worked on Monday, Wednesday and Friday for five hours each day and four hours on Saturday, how much will she get paid ?

Answer: \$390.40

5. A length of cloth measuring 6 m cost \$39. Find the cost of 15 m 20 cm of the same cloth.

Answer: \$98.80

6. Five men went out to lunch. When splitting the bill, each person had to pay \$25.20. If two people forget to bring their wallets, how much will the others each have to pay to ensure the whole amount is paid ?

Answer: \$42 each

7. If the surface area of a cube is $1\,350\text{ cm}^2$, find the length of its side.

Answer: 15 cm

8. Find 5 % of 3 480.

Answer: 174

Challenge Questions

1. The ratio of Ben's age to Jack's age is 4 : 5 now. In 6 years' time, the ratio will be 11 : 13. Find their present ages.

Answer: Ben is 16 years old and Jack is 20 years old

2. The cost of an adult ticket compared to a child ticket for a concert was in the ratio 5 : 3. Three adults and five children paid a total of \$120. How much does each ticket cost ?

Answer: Adult \$20 and Child \$12

3. Some ducks were walking in a line. One duck was behind two ducks, one duck was in front of two ducks and one duck was between two ducks. How many ducks were in the line ?

Answer: 3

4. Sixteen hockey teams will play in a knockout competition. Drawn matches are decided by a penalty shoot-out. In any round of games, the losing teams are eliminated, and the winning teams will go on to the next round of matches until the final match is played. How many matches in total will be played in the knockout competition ?

Answer: 15 matches in total

5. There are two different ways that Emily travels to school. Either she walks to school and catches the bus home or else catches the bus in the morning and walks home. In each case, her total travelling time is 45 minutes. If she catches the bus both ways, it takes 20 minutes. How long would it take if she walked both ways ?

Answer: 70 minutes

6. When Sue was 9, her father was 32. Now he is twice as old as she is. How old is Sue ?

Answer: 23 years old

7. Anna put some \$1 coins on the table. One half of them were tails up. Anna turned over two of the coins, and then one third of them were tails up. How many coins are on the table ?

Answer: There are 12 coins on the table