



1 Write down the type of correlation you would expect to see in a scatter graph of each of the following.

- The daily temperature and the number of ice creams sold at a kiosk.
- The age of a car and its value.

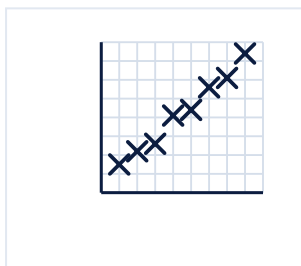
(2 marks)

As temperature rises, more ice creams are sold, so positive correlation

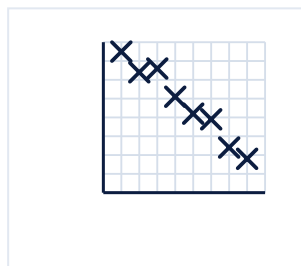
As a car gets older, its value falls, so negative correlation

2 Here are three scatter graphs, A, B and C.

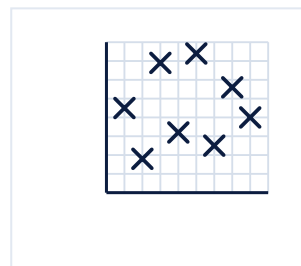
For each graph, write down the type of correlation it shows.



A



B



C

(3 marks)

uphill = positive, downhill = negative, no pattern = none

A positive

B negative

C no correlation

3

There are 200 pupils in Year 7 at Hillside School.

Jamal asks 50 of the Year 7 pupils how they get to school. 30 of them say they walk.

- Estimate how many of the 200 Year 7 pupils walk to school.
- Jamal asked the 50 pupils as they arrived through the main gate, which is next to the bus stop.  
Give one reason why his estimate might not be good for the whole of Year 7.

(3 marks)

a) fraction of the sample who walk

$$\frac{30}{50} = \frac{3}{5}$$

use the same fraction of the population

$$200 \div 5 = 40$$

$$3 \times 40 = 120$$

about 120 pupils

b)

he only asked pupils at the gate by the bus stop

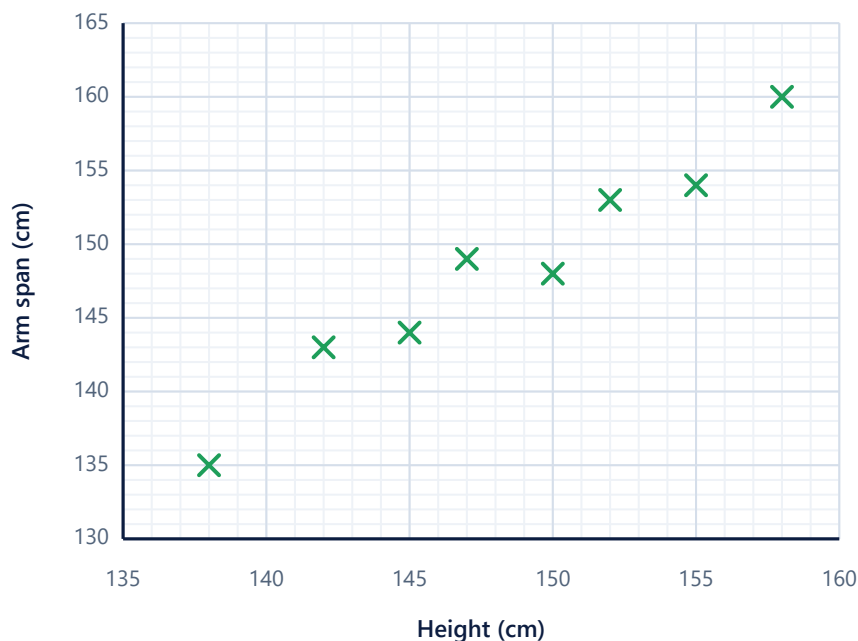
the sample may not represent all of Year 7

4

A PE teacher measures the height and the arm span of 8 Year 7 pupils.

| Height (cm)   | 138 | 142 | 145 | 147 | 150 | 152 | 155 | 158 |
|---------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Arm span (cm) | 135 | 143 | 144 | 149 | 148 | 153 | 154 | 160 |

- On the grid, plot the points to complete the scatter graph.
- Describe the relationship between height and arm span.



(3 marks)

a) height across, arm span up

first point (138, 135)

8 points plotted

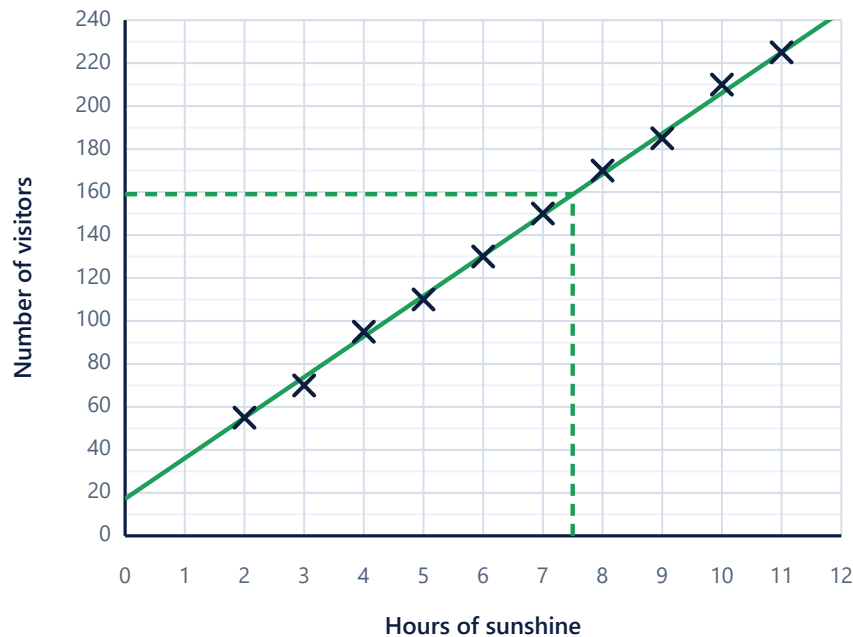
b) the points go uphill

positive correlation: taller pupils tend to have longer arm spans

5

The scatter graph shows the number of hours of sunshine and the number of visitors to a country park on each of 10 days.

- Describe the correlation shown by the scatter graph.
- On another day there were 7.5 hours of sunshine. By drawing a line of best fit, estimate the number of visitors to the park on this day.



(3 marks)

The points rise from bottom left to top right, so the correlation is positive

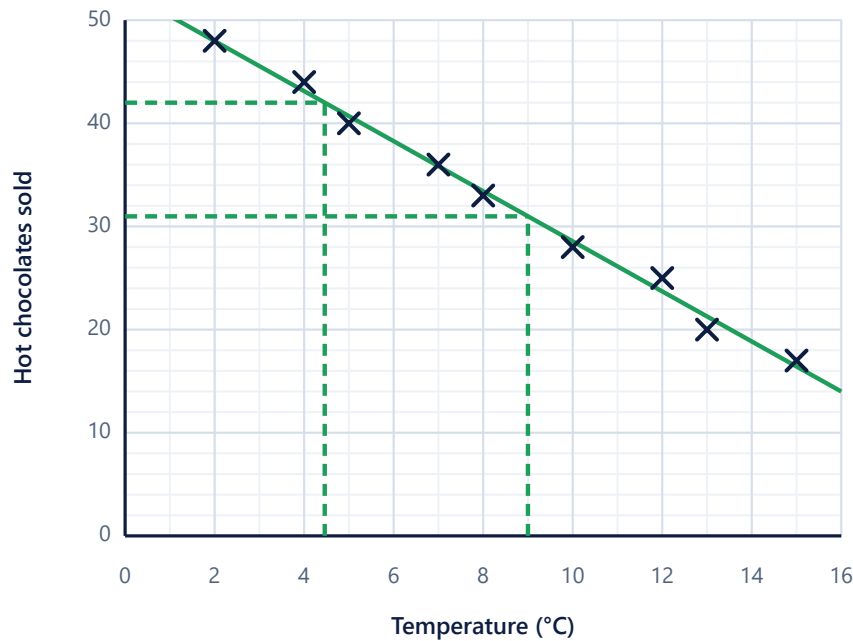
Draw a line of best fit through the middle of the points

Reading up from 7.5 hours to the line and across gives roughly 160 visitors (any value from 150 to 175 with a sensible line)

6

The scatter graph shows the outside temperature and the number of hot chocolates sold by a school canteen on 9 days.

- Describe the correlation.
- Draw a line of best fit on the scatter graph.
- Use your line to estimate the number of hot chocolates sold on a day when the temperature is  $9^{\circ}\text{C}$ .
- Use your line to estimate the temperature on a day when 42 hot chocolates are sold.



(4 marks)

a) the points go downhill

negative correlation

b) ruler, through the middle of the points

Line of best fit drawn

c) up from 9, across to the axis

about 31 hot chocolates

d) across from 42, down to the axis

about  $4.5^{\circ}\text{C}$

7

40 students each chose one sport. 15 chose football and 6 chose tennis. Ellie is going to draw a pie chart of the results.

- Work out the angle Ellie should use for football.
- Work out the angle Ellie should use for tennis.

(3 marks)

Each student is worth  $360$  divided by  $40 = 9$  degrees

a) Football

$$15 \times 9 = 135 \text{ degrees}$$

b) Tennis

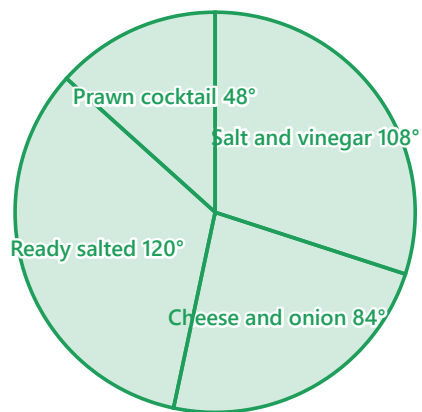
$$6 \times 9 = 54 \text{ degrees}$$

8

30 pupils were asked to name their favourite flavour of crisps.

| Flavour          | Frequency |
|------------------|-----------|
| Salt and vinegar | 9         |
| Cheese and onion | 7         |
| Ready salted     | 10        |
| Prawn cocktail   | 4         |

Draw an accurate pie chart for this information.



(4 marks)

angle for one pupil

$$360 \div 30 = 12$$

$$9 \times 12 = 108$$

$$7 \times 12 = 84$$

$$10 \times 12 = 120$$

$$4 \times 12 = 48$$

check the total

$$108 + 84 + 120 + 48 = 360$$

$$108^{\circ}, 84^{\circ}, 120^{\circ}, 48^{\circ}$$

9

A pie chart shows information about the members of a leisure centre.

The sector for swimming has an angle of  $72^\circ$  and represents 18 members.

Work out the total number of members of the leisure centre.

(3 marks)

72 degrees represents 18 members, so 1 degree represents 18

divided by 72 = 0.25 members

The whole pie chart is 360 degrees

$$360 \times 0.25 = 90 \text{ members}$$

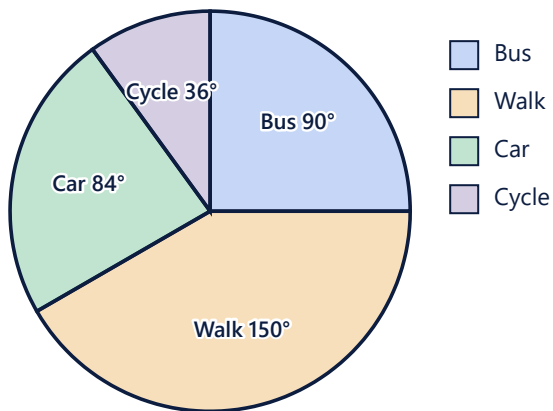
Alternatively, 360 divided by 72 = 5, and  $18 \times 5 = 90$

90

10

The pie chart shows how 60 pupils travel to school.

- What fraction of the pupils walk? Give your answer in its simplest form.
- How many pupils travel by car?
- How many more pupils walk than travel by bus?



(4 marks)

a) Walk angle out of 360

$$\frac{150}{360} = \frac{15}{36}$$

$$= \frac{5}{12}$$

|                |
|----------------|
| $\frac{5}{12}$ |
|----------------|

b) degrees for one pupil

$$360 \div 60 = 6$$

$$84 \div 6 = 14$$

|           |
|-----------|
| 14 pupils |
|-----------|

c)

$$150 \div 6 = 25$$

$$90 \div 6 = 15$$

$$25 - 15 = 10$$

|         |
|---------|
| 10 more |
|---------|

11

Two schools each drew a pie chart to show their students' favourite lunch.

| School   | Number of students | Angle for pizza |
|----------|--------------------|-----------------|
| School A | 80                 | 45°             |
| School B | 240                | 30°             |

Sam says, "More students chose pizza at School A than at School B, because the angle for pizza is bigger at School A."

Is Sam right? You must show your working.

(4 marks)

School A

$$\frac{45}{360} \times 80 = 10 \text{ students chose pizza}$$

School B

$$\frac{30}{360} \times 240 = 20 \text{ students chose pizza}$$

20 > 10, so Sam is wrong. The pie charts represent different numbers of students, so a bigger angle does not mean a bigger number