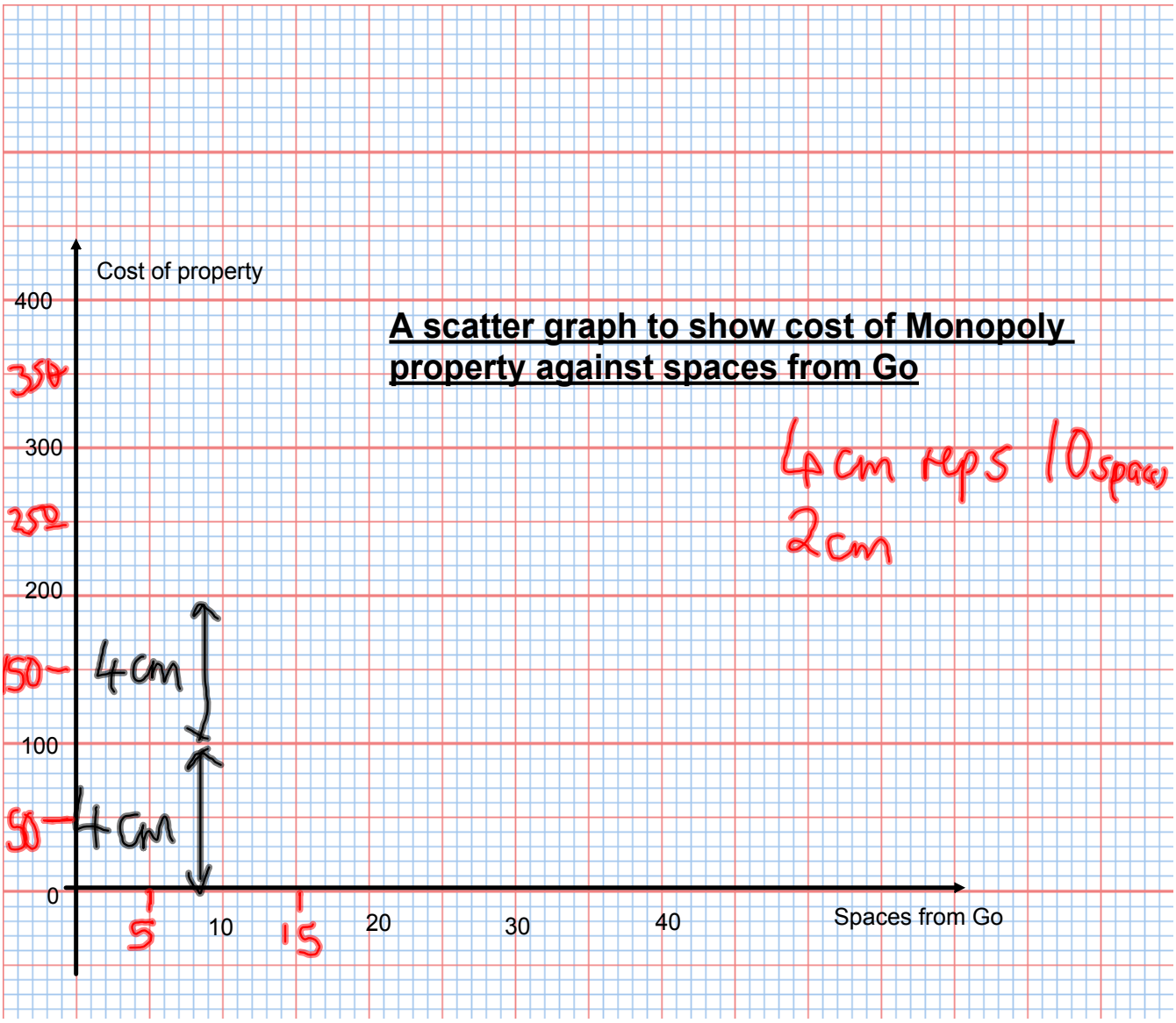
Monopoly Mayhem

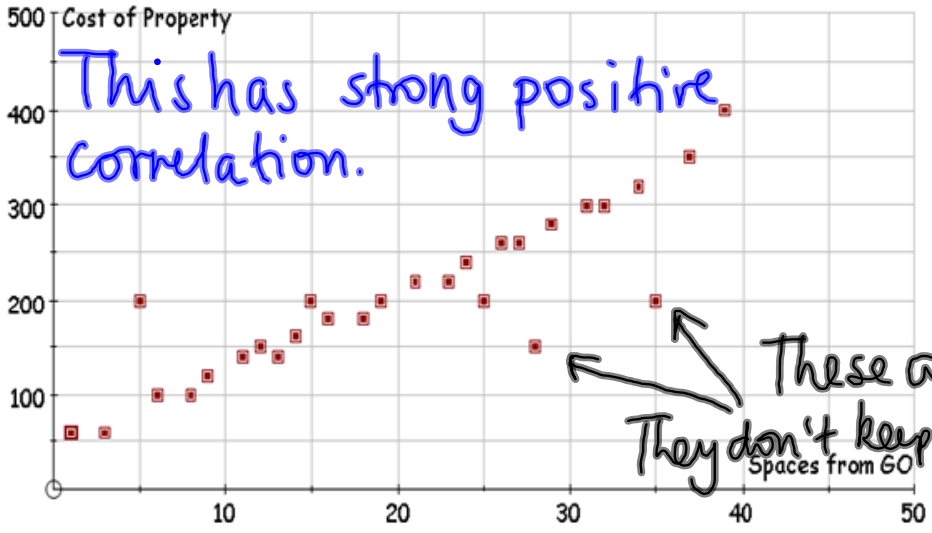
The game of Monopoly was created in 1935. Since then it has been published in 26 languages and is available in 80 countries across the world. 200 million sets have been sold and it is estimated that there is 300 billion pounds of Monopoly money in UK homes. For those of you who have never played, you move around a board with the option to purchase the property that you land on. As a property tycoon you are trying to bankrupt your fellow players and take home all the loot.

Property	Spaces from Go	Cost
Old Kent Rd	1	£60
Whitechapel Rd	3	£60
Kings Cross Station	5	£200
The Ange, Islington	6	£100
Euston Rd	8	£100
Pentonville Rd	9	£120
Pall Mall	11	£140
Electric Company	12	£150
Whitehall	13	£140
Northumberland Ave	14	£160
Marylebone Station	15	£200
Bow Street	16	£180
Marlborough St	18	£180
Vine St	19	£200
The Strand	21	£220
Fleet St	23	£220
Trafalgar Square	24	£240
Fenchurch St Station	25	£200
Leicester Square	26	£260
Coventry St	27	£260
Water Works	28	£150
Piccadilly	29	£280
Regent St	31	£300
Oxford St	32	£300
Bond St	34	£320
Liverpool St Station	35	£200
Park Lane	37	£350
Mayfair	39	£400

The properties vary in price. The more illustrious locations, like Park Lane, will, of course, cost you more. Looking at the table opposite, can you see a relationship between the spaces from GO and how much the property costs? One way of displaying this information is to plot a scatter graph. It clearly shows any patterns or trends in the data and helps you describe the relationship between the two variables (the things you are comparing - see the axis labels). Either plot this yourself, or use the graph ready prepared on the next page.


Cost of property
400
350
300
250
200
150
100
50
0
4cm
4cm
5
10
15
20
30
40
Spaces from Go
A scatter graph to show cost of Monopoly property against spaces from Go
4cm reps 10spaces
2cm

The further you are from Go the more the property costs.



Can you see a relationship between 'Spaces from GO' and the 'Cost' of the property? Write a sentence to describe it. Are there any points which do not seem to fit the trend? Without looking at the table can you guess which properties they are?

In order to show the trend more clearly we can draw on the graph a 'Line of Best Fit', or 'Trendline'. Draw a line on your graph (or the one above) which best fits the points. We use this line to make estimates. For example, if you put a property 22 spaces away from GO, how much do you think it should cost? Why would this only be an estimate?

All straight lines can be written in the format $y=mx+c$. This describes the relationship between the x axis variable and the y axis variable. Find out what the 'm' and 'c' mean and try to calculate the equation of your Line of Best Fit.

You can use this equation to help you predict what might happen. Use your equation to find out the cost of a property that is 50 spaces away from GO. Why might this not be right? What assumptions would you be making?

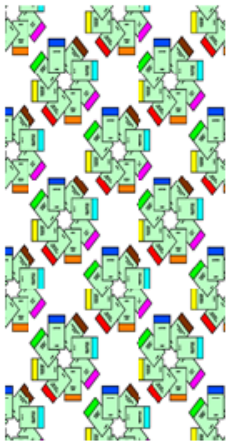
In Monopoly you throw two dice for your turn. On your first go, how many spaces from 'GO' are you most likely to end up? Why?

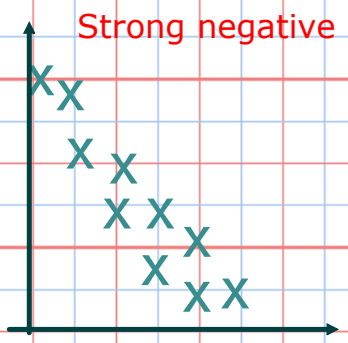
The makers, Hasbro, tell us that the most landed on properties are Bow Street, Vine Street and Marlborough Street (the orange ones). Can you think why? Discuss with your class.

There are 10 tokens that represent the players on the board. Brainstorm or use this link to find out what they are:
http://www.monopoly.co.uk/index2.asp .

If you had first choice at the start of the game, and you picked one at random, what is the chance of you picking an animal? Would this probability be the same if you were choosing for yourself? Why?

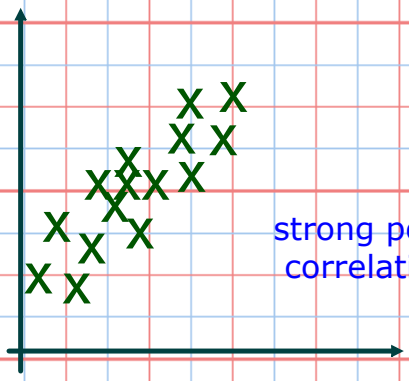
Graph created using Autograph V 3



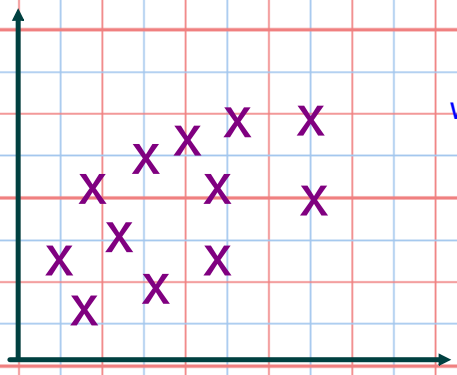


Strong negative correlation

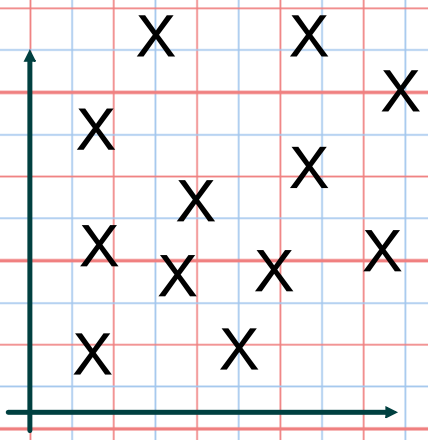
weak negative correlation



strong positive correlation



weak positive correlation

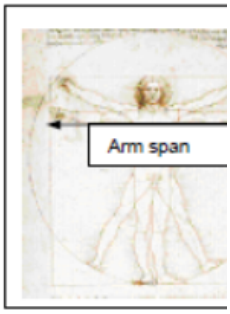


No correlation

page 227 A2 and A4

Student worksheet

The Vitruvian theory—does it apply to you?



Leonardo da Vinci (1452–1519) was a scientist and an artist, one of the greatest painters of the Italian Renaissance. He left only a handful of completed paintings, one of which is the *Mona Lisa*. He was so secretive that he wrote backwards to disguise his ideas.

In 1492, Leonardo drew a picture of a man standing inside a circle and a square. This is known as the 'Vitruvian Man'. It was a study of the proportions of the human body as described by Vitruvius, a Roman architect from the first century B.C. Based on his observations of European people of his day, Leonardo believed that arm span was equal to height in a perfectly proportioned body.

Why do you think he was interested in working out body proportions?

Do you think the Vitruvian theory illustrated by Leonardo would work today?

Problem

Is the Vitruvian theory that height is equal to arm span true for British students today?

Plan

Before you begin your investigation, what answer do you predict? Why? _____

_____

Now test your prediction using data from your class.

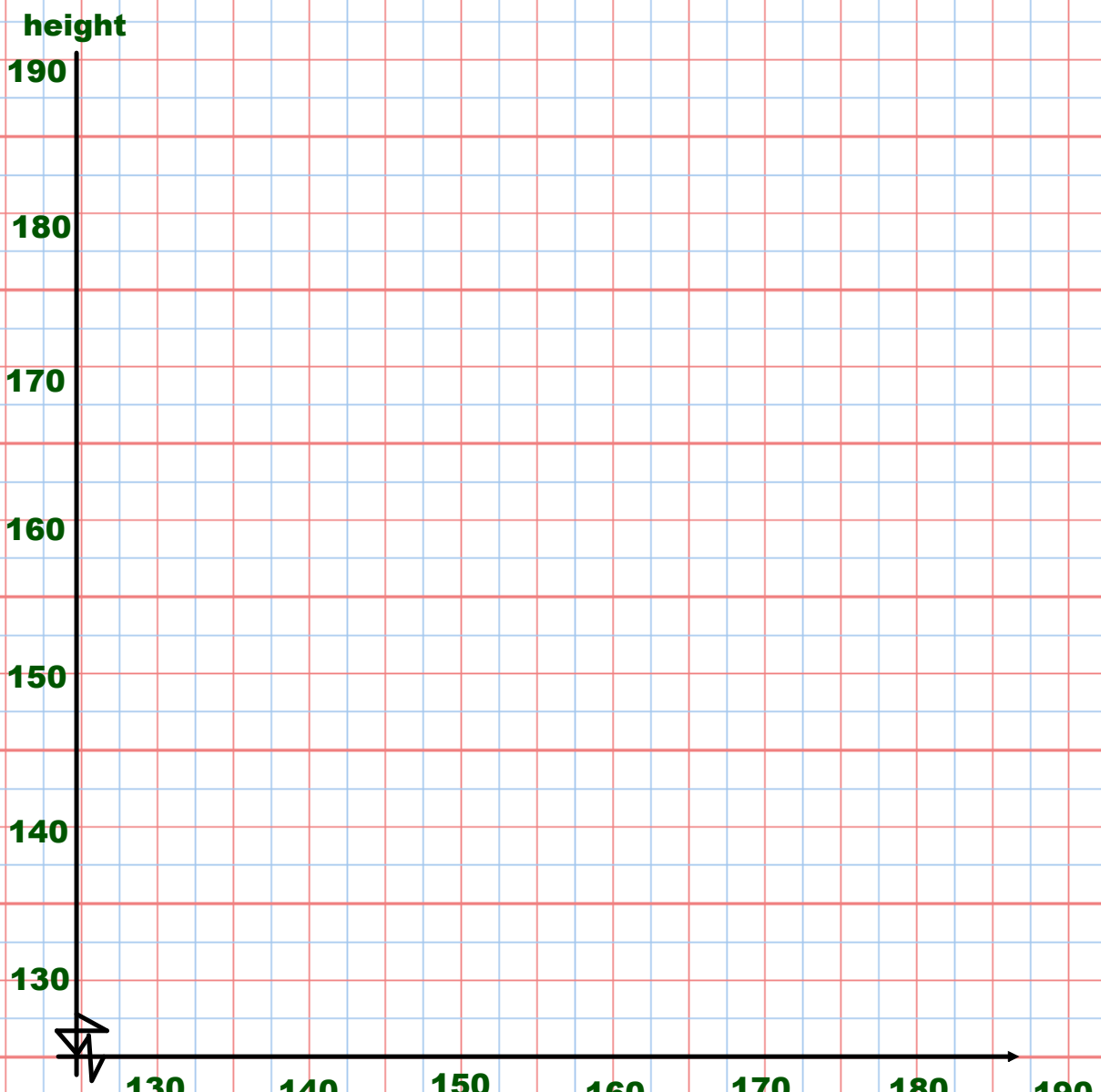
Data

Enter the data for 10 students from your class in this table.

How will you select the students for your sample?

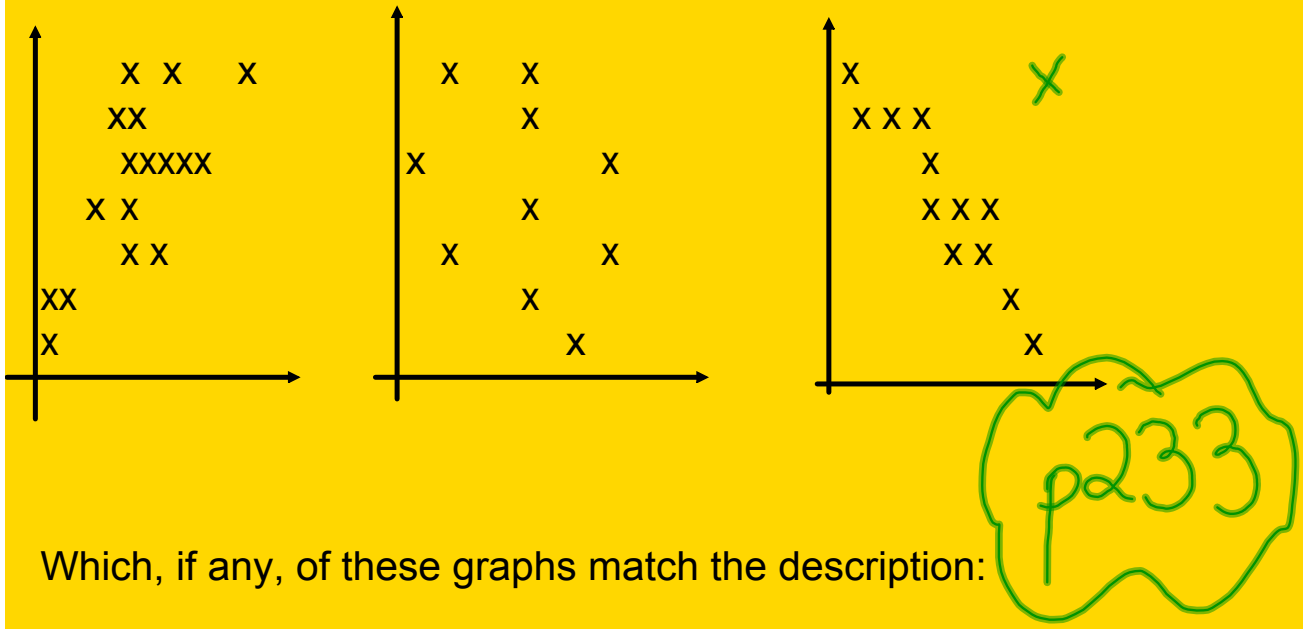
Girls height	Girls armspan	Boys height	Boys armspan
162	158	176	176
158	163	160	160
164	158	165	160
160	156	167	169
161	158	172	169
		171	170
		171	173

A scatter graph to show...



page 171 B1

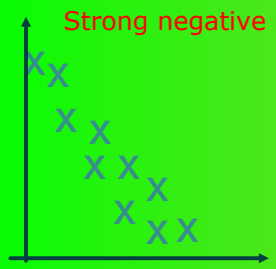
Scatter graphs

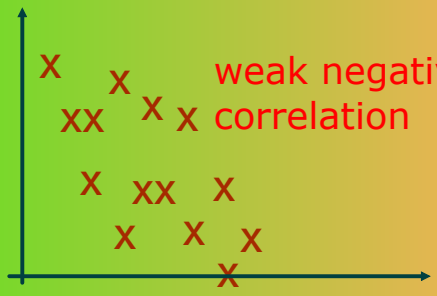


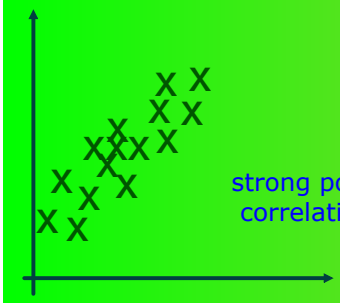
Which, if any, of these graphs match the description:

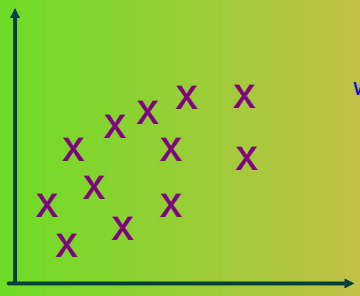
- Number of plane journeys travelled against age of traveller.
- The amount of time spent shopping and the amount of money spent
- Size of feet against number of teeth
- Temperature against distance from the equator
- Estimated grade in English against estimated grade in Maths
- Number of hours of TV watched against amount of homework done.

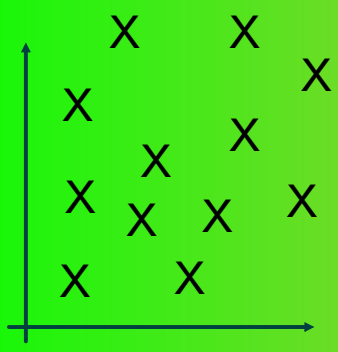
Correlation











page 233

page 234 C1 and C2

page 235: Find the connection

Lines of Best Fit

When a scatter graph has reasonably close correlation a line of best fit helps to see the general trend.

Use your ruler to cover over as many crosses as possible.

The line going down the centre of your ruler is the approx line of best fit.

If you can only cover a small percentage of the crosses there is probably no correlation.

Monopoly Mayhem

Drawing your own scatter graph

1. Choose 2 columns of data
2. Put a circle around the highest piece of data for each column.
3. Make the first column the x axis (going across). Put a squiggly line if you aren't starting with zero. decide on a scale.
4. Do the same for the vertical axis.
5. Plot points.
6. Put a title.
7. Write comments about your graph.

Attachments

Monopoly.pdf

waste.pdf