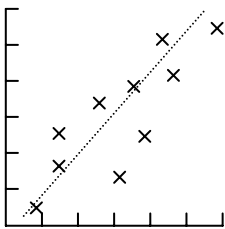


Recognise Positive, Negative & Zero Correlation using Lines of Best Fit HD1

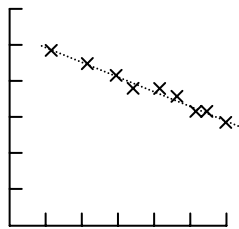
A scatter diagram is used to show the relationship, called **correlation** between two variables.

Positive Correlation



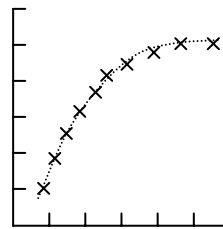
The points lie close to a straight line sloping from lower left to upper right.

Negative Correlation



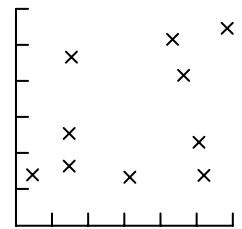
The points lie close to a straight line sloping from upper left to lower right.

Zero or No Correlation



Points following a curve have a curvilinear relationship but no correlation, as correlation in your examination means a linear (straight line) relationship.

Zero or No Correlation



Points more randomly placed have no or zero correlation.

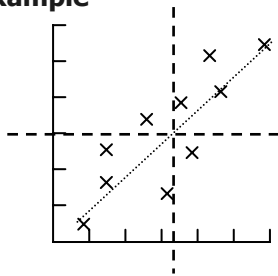
*The closer the points are to the line, the stronger the correlation. So the first diagram could be described as **moderate positive** correlation, the second as **strong negative** correlation. **Note** if all the points lie **on** the line, then this is called **perfect** correlation.*

*For no correlation do **NOT** draw a line of best fit*

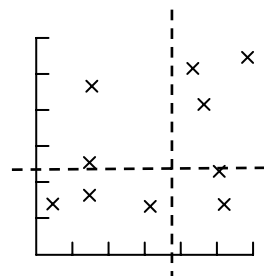
Draw Lines of Best Fit by Eye

Special Strategy 1 – use the following technique to help you decide whether points show correlation or no correlation. Draw a vertical straight line so that there are the same number of points left and right of it. Then draw a horizontal straight line so that there are the same number of points above and below it. Now count the number of points in each of the four sections. For there to be correlation the vast majority (at least 75%) of the points will usually lie in two diagonally opposite sections.

Example



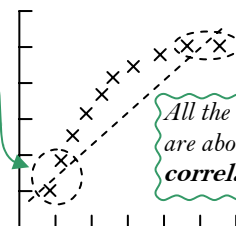
8 points out of 10 lie in bottom left and top right corner. This indicates possible correlation. The points lie fairly close to the line drawn, indicating moderate positive correlation.



6 points out of 10 lie in bottom left and top right corner. This indicates no correlation. No straight line can be drawn where the points lie close, so there is no correlation.

Special Strategy 2

– A great way to draw the line of best fit. Draw a straight line connecting the midpoint of the two points furthest to the left to the midpoint of the two points furthest to the right. If the points are all **close to** this line and on **both sides** of this line then there is a correlation, if not then no correlation. Adjust your line to more closely fit all the points as required – a line passing through the intersection of the horizontal and vertical line, from **Strategy 1**, is likely to be good. Always use both techniques to help you identify correlation and to draw the line of best fit. **Important: The line of best fit will normally have a similar number of points above and below the line.**



*All the other points are above, so **no correlation**.*

Your Turn!!

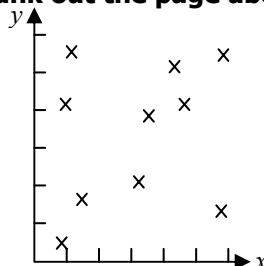
Start by plotting the points (6, 5), (5, 7), (7, 8), (9, 8), (1, 1), (2, 3), (4, 4).

- Using **Strategy 1**, how many points are in the bottom left hand corner of the grid?
- Using **Strategy 2**, which two points are i) furthest to the left and ii) furthest to the right?
- Draw your 'first estimate' of the line of best fit using **Strategy 2**: how many points are above the line?
- Describe the correlation.

RAPID 'ACID' TEST – Blank out the page above before answering these!

- Describe the correlation and draw the lines of best fit in pencil where appropriate.

i)



ii)

