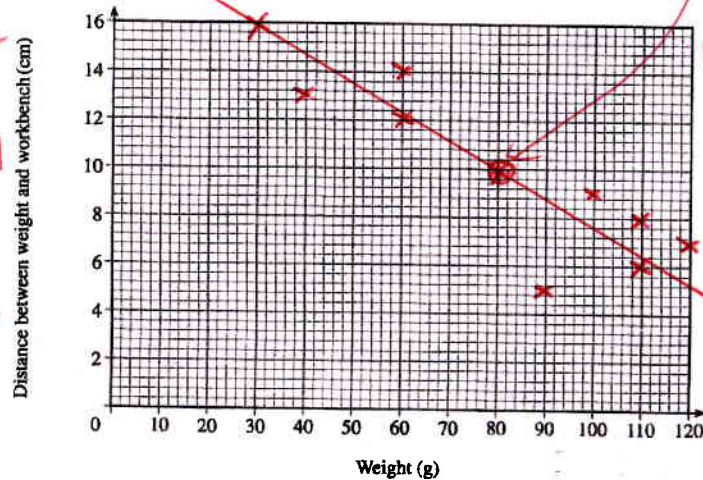# Scatter Graphs PPQ's

(i) In a science lesson Jessica hangs some weights on an elastic band and measures the distances between the weights and the workbench. The table below shows her results.

Weight (g)	60	110	30	80	60	100	90	120	40	110
Distance between weight and workbench (cm)	12	6	16	10	14	9	5	7	13	8

(a) On the grid below, draw a scatter diagram to show these results.

Using a clear ruler helps as you can then still see the points that have been covered.

Mark the mean point distinctively from the others.

[2]

(b) The mean of the weights is 80 g.
Calculate the mean distance of the weights from the workbench.

$12+6+16+10+14+9+5+7+13+8 = \dfrac{100}{10} = 10$

[1]

(c) Draw the line of best fit on your scatter diagram. [2]

*(d)* Which type of correlation does your scatter diagram show?

NEGATIVE

[1]

Turn over.

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(2) A psychologist asks some people how many times they have wired a plug. Each person is then asked to wire a plug and the time taken is recorded. The mean number of times people have wired a plug is 6. The mean time taken to wire a plug is 10 minutes.
The scatter diagram below shows the number of times a person has wired a plug and the time taken to wire a plug for each of 10 people.
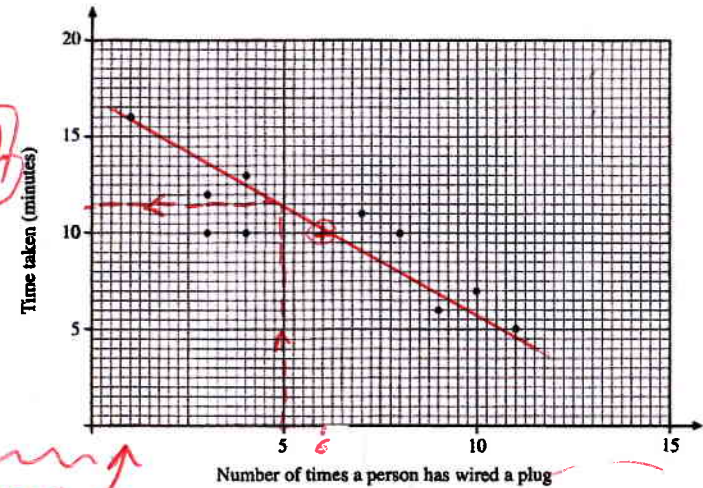
NASTY SCALE...
20 little squares to 5 so each little square = 5/20 = 0.25
4 squares = 1

(a) Draw the line of best fit on the scatter diagram. [2]

(b) Jeremy had wired a plug 5 times. Estimate how long it will take him to wire one plug.

11½ Minutes

[1]

When reading your answers from a line of best fit they can differ from mine because your line will be at slightly different gradients
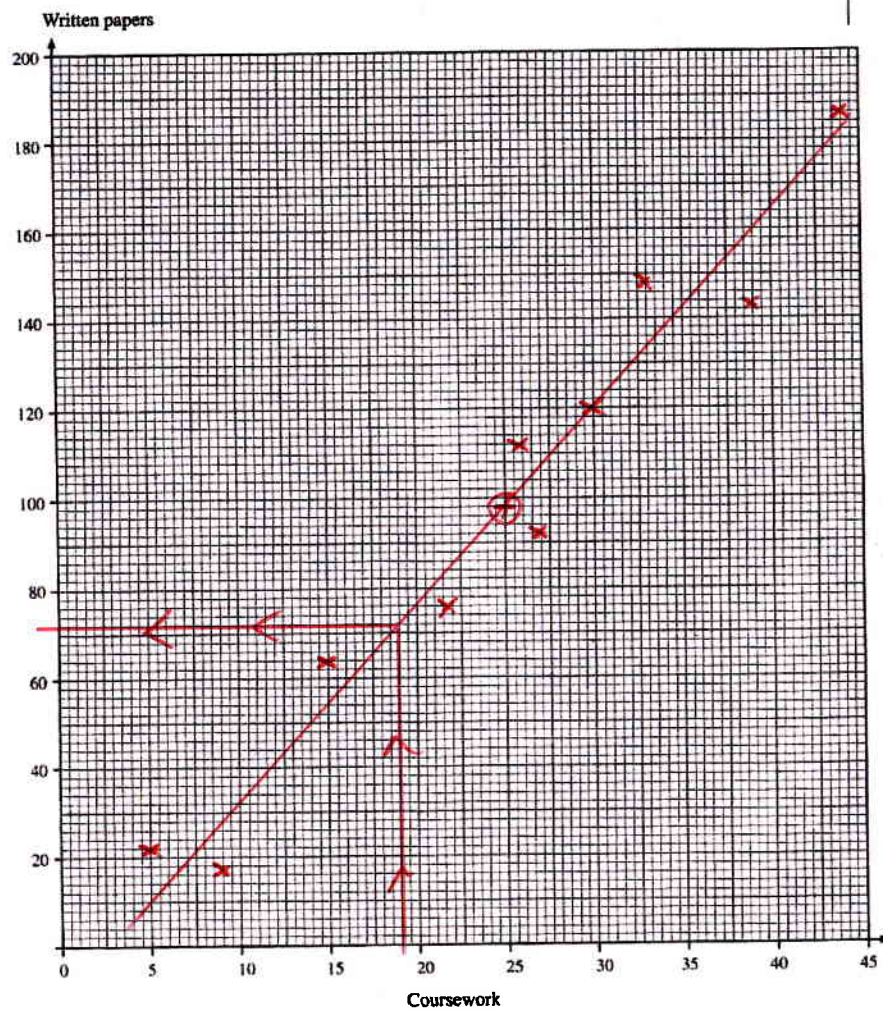
Turn over.

(3) The assessment for a mathematics examination consists of two parts, namely, coursework marked out of 50, and written papers, marked out of 200. The marks for ten pupils are given in the table.

Coursework mark	5	30	15	44	9	22	39	26	33	27
Written papers mark	22	120	64	186	17	76	143	112	148	92

(a) On the graph paper below, draw a scatter diagram to display these results. [2]

Written papers / Coursework

(b) What type of correlation does your scatter diagram show?

positive

[1]

(c) The mean coursework mark for the pupils is 25 and the mean mark of the written papers is 98.
Draw a line of best fit on your scatter diagram. [2]

(d) Another pupil completed the coursework and was given a mark of 19, but was absent from the written papers examination. Use your line of best fit to estimate the mark on the written papers for this pupil. 72

[1]

Turn over.

WARM UP 1

Louise buys milk in 2 litre cartons. She uses $1\frac{2}{3}$ litres of milk every day. What is the least number of cartons of milk she would need to buy in ten days?

$1\frac{2}{3}$ litres $= \frac{5}{3}$ litres each day

For 10 days $= \frac{5}{3} \times 10 = \frac{50}{3}$ litres

in 2 litre cartons so $\frac{50}{3} \times \frac{1}{2} = \frac{25}{3} = 8\frac{1}{3}$ cartons
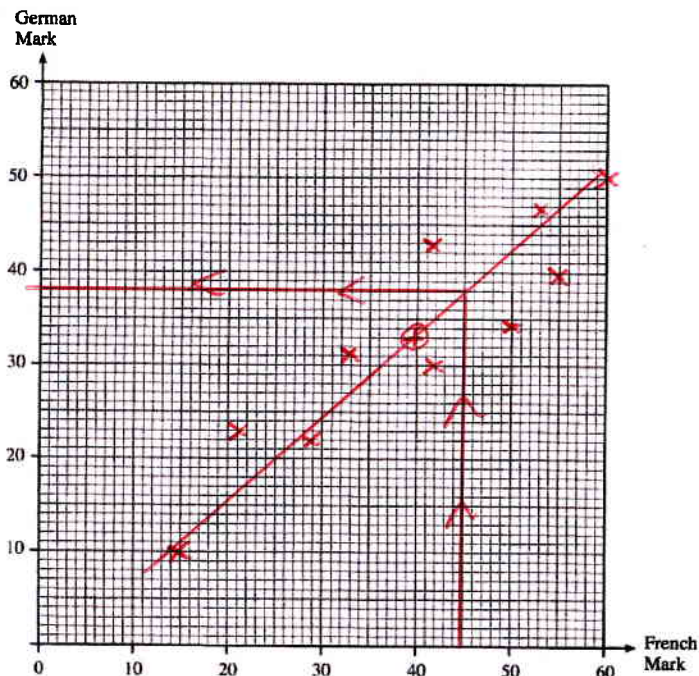
[3]

So Need 9 cartons

Yuk! ☹

④

The table gives the marks obtained by ten students in their French and German tests.

French	15	33	42	50	55	53	42	21	60	29
German	10	31	43	34	40	47	30	23	50	22

(a) On the graph paper below, draw a scatter diagram of these results. [2]

(b) Describe the correlation between the two sets of marks.

positive

[1]

(c) The mean marks for the French and German tests are 40 and 33 respectively. Draw the line of best fit on your scatter diagram.

[2]

(d) Jill scored 45 on her French test, but was absent for the German test. Use your line to estimate the mark she would have obtained in the German test.

38

[1]

WARM UP 2

Adrian, Neville and Bobby invest £1800, £3700 and £2500 respectively in a business venture which makes them a profit of £1600. They share the profit in proportion to how much they each invested. Calculate how much each of them gets.

1800 : 3700 : 2500

÷100   18 : 37 : 25

N° of parts $= 18 + 37 + 25 = 80$

each part $= £1600 \div 80 = £20$

Adrian gets $18 \times 20 = £360$
Neville gets $37 \times 20 = £740$
Bobby gets $25 \times 20 = £500$

[3]

(5) The engine capacity, measured in cubic centimetres (c.c.) and the time, in seconds, taken to accelerate to a certain speed, for each of 8 cars, are given in the table.

Engine capacity (c.c.)	1000	1100	1200	1300	1400	1600	1800	2000
Acceleration time (s)	15·4	14·0	13·4	11·4	11·8	9·1	6·9	6·0

(a) On the graph paper opposite, draw a scatter diagram to display these results. [2]

(b) What type of correlation does your scatter diagram show?
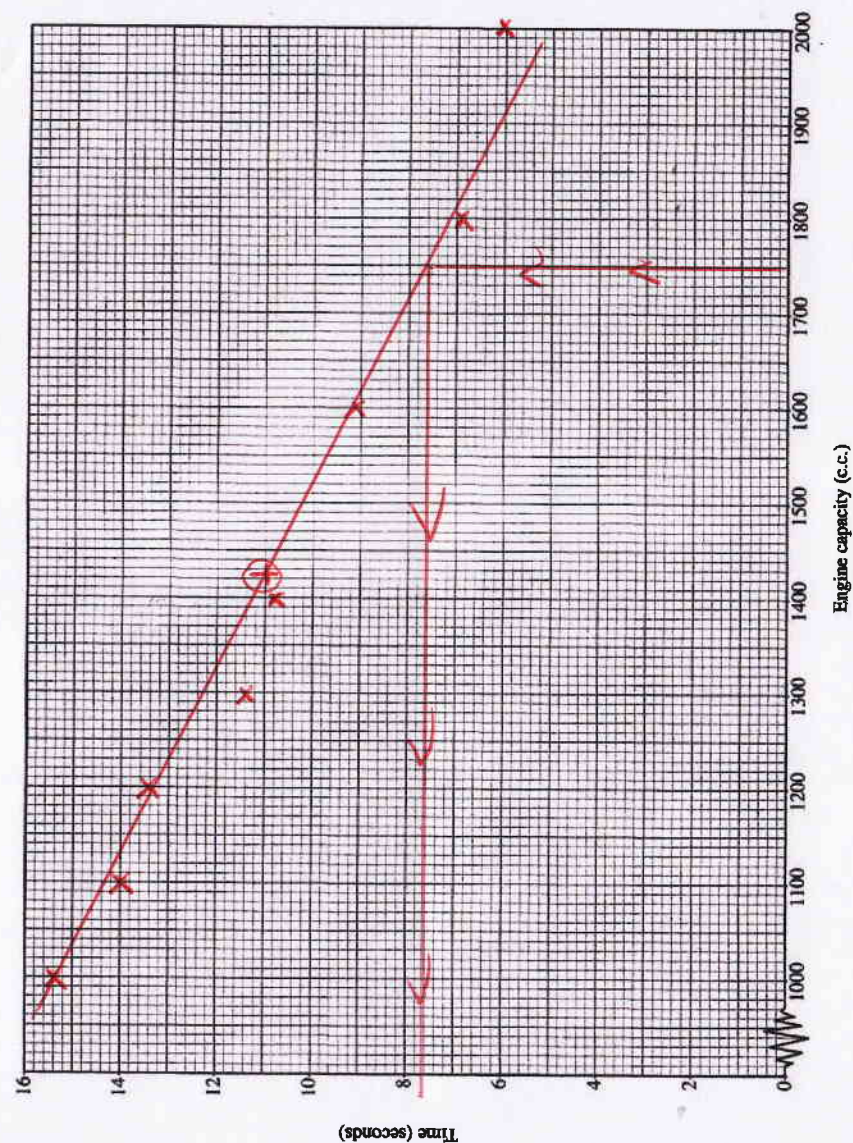
NEGATIVE

[1]

(c) The mean engine capacity is 1425 c.c. and the mean acceleration time is 11 seconds. Draw a line of best fit on your scatter diagram. [2]

(d) Use your line of best fit to estimate the acceleration time for a car with an engine capacity of 1750 c.c.

7·6 seconds.

[1]

Engine capacity (c.c.)

Time (seconds)