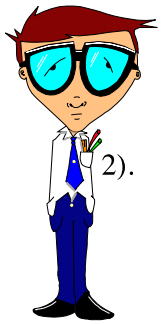
Scatter Graphs 1.

1). 10 pupils sat both Maths and Physics exams, here are their scores:

	A	B	C	D	E	F	G	H	I	J
Maths	56	24	67	70	71	42	48	32	52	80
Physics	65	38	71	72	73	51	56	42	57	82

a). Plot them as a scatter graph and comment on the type of correlation shown.
b). Draw in the **line of best fit**.
c). Use your graph to answer these questions, showing any construction lines used.



i). One pupil scored 65 % in the Maths exam, but was absent for the Physics exam.
What would be an appropriate estimate for that pupil's Physics examination ?
ii). A pupil scored 39 % in the Physics exam, give an estimate for the Maths exam score ?

2). 12 pupils sat both Science and History exams, here are their scores:

	A	B	C	D	E	F	G	H	I	J	K	L
Science	15	63	18	34	44	50	25	54	85	29	39	74
History	72	38	72	58	52	50	66	44	19	63	54	28

a). Plot them as a scatter graph and comment on the type of correlation shown.
b). Draw in the **line of best fit**.
c). Use your graph to answer these questions, showing any construction lines used.
i). One pupil scored 60 % in the Science exam, but was absent for the History exam.
What would be an appropriate estimate for that pupil ?
ii). A pupil scored 60 % in the History exam, what do you think the pupil got in the Science exam ?

3). Here are the scores of 10 people who took an Intelligence test. The I.Q. was measured as a percentage of the test. Their ages were also recorded.

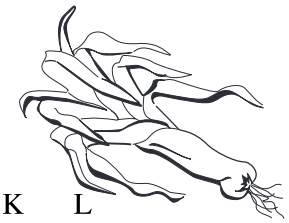
	A	B	C	D	E	F	G	H	I	J
Age of person	22	41	83	30	55	62	72	39	26	65
I.Q. %	73	36	66	47	96	64	41	64	91	88

a). Plot them as a scatter graph and comment on the type of correlation shown.
b). If a 50 year old took the test, could you predict from the graph the score the person would get ?

4). A Biologist took measurements from a selection of 12 Beech leaves.

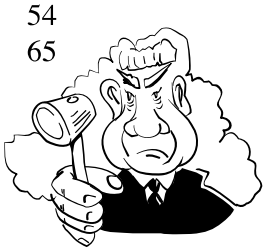
	A	B	C	D	E	F	G	H	I	J	K	L
Width (mm)	28	25	16	32	40	25	22	11	36	15	19	4
Length (mm)	49	46	27	55	68	18	37	21	61	28	34	8

a). Plot them as a scatter graph and comment on the type of correlation shown.
b). Draw in the **line of best fit**.
c). Use your graph to answer these questions, showing any construction lines used.
i). If the width of a leaf is 35 mm, give a good estimate of the length of the leaf.
ii). If the length of a leaf is 30 mm, give a good estimate of the width of the leaf.
d). When conducting the measurements the Biologist made a mistake measuring one of the leaves.
Which leaf was it ?



5). Here are the scores given to 12 entrants in the "champion leek" competition.

	A	B	C	D	E	F	G	H	I	J	K	L
Judge 1	70	25	50	15	72	25	5	40	80	60	35	54
Judge 2	85	30	55	10	88	26	1	71	95	69	40	65



a). Plot them as a scatter graph and comment on the type of correlation shown.
b). Draw in the **line of best fit**.
c). i). A late entrant scored 65 marks from Judge 1, but Judge 2 had gone home. What would be an appropriate mark for that entrant ?
ii). Judge 2 gave last years winner 82 marks. What would judge 1 have given last years winner ?
d). One of the leeks got misjudged due to a technical error. Which leek do you think it was ?

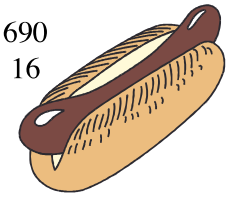
6). A basketball coach wonders if there is a link between the number of points a player scores and the number of fouls a player gives away in a match. Here are 10 players scores for one match.

	A	B	C	D	E	F	G	H	I	J
Fouls against	3	5	15	9	42	22	45	6	36	27
Points scored	1	0	22	9	72	30	85	3	57	54

a). Plot them as a scatter graph and comment on the type of correlation shown.
b). Draw in the **line of best fit**.
c). i). One player scored 50 points, how many fouls do you think he picked up ?
ii). One player gave away 12 fouls, how many points do you think he scored ?

7). A hotdog vendor recorded the number of hotdogs sold in a day (to the nearest 10) and the maximum temperature that day (˚C). Here is a fair selection of results.

Hotdogs sold	610	250	90	780	400	130	420	850	680	510	270	690
Temperature ˚C	14	32	39	9	27	34	22	4	35	20	27	16



a). Plot them as a scatter graph and comment on the type of correlation shown.
b). Draw in the **line of best fit**.
c). i). How many hotdogs would he expect to sell when the maximum temperature is 30˚C that day ?
ii). If he sold 700 hotdogs in a day what do you think the maximum temperature was ?
d). One of the days was National Hotdog Day, when the public was encouraged to buy more hotdogs. Which set of results do you think show this day ?

8). 12 pupils sat Physics and Chemistry exams. Here are their percentage scores:

Physics	55	44	57	73	59	49	50	35	47	51	61	39
Chemistry	50	37	55	70	58	60	44	29	44	49	60	32

a). Plot them as a scatter graph and comment on the type of correlation shown.
b). Draw in the **line of best fit**.
c). i). A pupil scored 40 % in the Chemistry exam, but was absent for the Physics exam. What would be an appropriate estimate for that pupil ?
ii). A pupil scored 65 % in Physics, what do you think they got in the Chemistry exam ?
d). One pupil felt very ill for the Physics exams, but fine for Chemistry. Which pupil was it ?

Scatter Graphs 2.

1). A speedometer measuring Km/h is found to be faulty. It is then tested to find out the readings that it gives against the true speed of the car. Here are the test results.

True speed, x	80	8	23	40	32	54	73	67	17	56
Speedometer Reading, y	71	19	28	44	38	52	68	60	26	54

a). Plot them as a scatter graph.

b). Calculate the **mean** of :-

i). the true speed of the car, $\bar{x}$,

ii). the speedometer readings, $\bar{y}$.

c). Plot $(\bar{x}, \bar{y})$ on the scatter graph and indicate this point.

d). Draw in the **line of best fit** and comment on the type of correlation shown.

e). i). If the true speed of the car is 30 Km/h, what would be a good estimate for the reading that the speedometer would show ?

ii). If the speedometer shows 65 Km/h, what is a good estimate of the true speed ?

2). 10 pupils sat Paper 1 and Paper 2 of a Physics exam. Here are their results :

Physics P1, x	60	50	30	46	25	36	31	19	43	20
Physics P2, y	55	49	34	44	30	40	36	26	41	25

a). Plot them as a scatter graph.

b). Calculate the **mean** of :-

i). the Paper 1 results, $\bar{x}$,

ii). the Paper 2 results, $\bar{y}$.

c). Plot $(\bar{x}, \bar{y})$ on the scatter graph and indicate this point.

d). Draw in the **line of best fit** and comment on the type of correlation shown.

e). i). One pupil scored 55 % in Paper 1, but was absent for Paper 2.
What would be an appropriate estimate for Paper 2 for that pupil ?

ii). A pupil scored 20 % in Paper 2, what do you think the pupil got in Paper 1?

3). A business woman records the length of time it takes to get to work in a morning and the maximum speed on her journey.

Journey time (minutes)	35	10	70	48	23	22	51	44	29	56
Maximum speed (Km/h)	50	67	20	36	55	60	32	42	50	34

a). Plot them as a scatter graph.

b). Calculate the **mean** of :-

i). the journey time, $\bar{x}$,

ii). the maximum speed, $\bar{y}$.

c). Plot $(\bar{x}, \bar{y})$ on the scatter graph and indicate this point.

d). Draw in the **line of best fit** and comment on the type of correlation shown.

e). i). One day the journey time was 60 minutes. What would be an appropriate estimate for the maximum speed she reached on that journey ?

ii). Another day the maximum speed she reaches is 38 Km/h.
What would be a good estimate of that journey's time ?

4). 10 pupils sat a Physics and Chemistry exam. Here are their percentages:

Physics, P	10	70	52	32	79	22	45	63	12	55
Chemistry, C	19	82	60	43	88	31	54	73	23	67

a). Plot them as a scatter graph.

b). Calculate the **mean** of :-

i). the Physics exam, $\overline{P}$, ii). the Chemistry exam, $\overline{C}$.

c). Plot ($\overline{C}$, $\overline{P}$) on the scatter graph and indicate this point.

d). Draw in the **line of best fit** and comment on the type of correlation shown.

e). i). One pupil scored 40 % in the Physics exam, but was absent for the Chemistry exam. What would be an appropriate estimate for that pupil ?

ii). A pupil scored 80 % in the Chemistry exam, what do you think they got in the Physics exam ?

f). The equation of the line of best fit can be written as $C = aP + b$, where a and b are numbers. Find the values of a and b.

g). Use your formula to find the value of C when

i). P = 24%, ii). P = 72%, iii). P = 37%.

5). 10 pupils sat a Maths and Physics exam. Here are their percentages:

Maths, M	15	71	60	35	25	47	85	19	79	34
Physics, P	40	72	64	55	46	60	75	46	72	50

a). Plot them as a scatter graph.

b). Calculate the **mean** of :-

i). the Maths exam, $\overline{M}$, ii). the Physics exam, $\overline{P}$.

c). Plot ($\overline{M}$, $\overline{P}$) on the scatter graph and indicate this point.

d). Draw in the **line of best fit** and comment on the type of correlation shown.

e). i). One pupil scored 65 % in the Maths exam, but was absent for the Physics exam. What would be an appropriate estimate for that pupil ?

ii). A pupil scored 41 % in the Physics exam, what do you think they got in the Maths exam ?

f). The equation of the line of best fit can be written as $P = aM + b$, where a and b are numbers. Find the values of a and b.

g). Use your formula to find the value of P when

i). M = 90%, ii). M = 96%, iii). 100%.

6). Here are the equivalent British and Continental shoe sizes.

British, B	1	2	3	4	5	6	7
Continental, C	33	34	36	37	38	39	41

a). Plot them as a scatter graph.

b). Calculate the **mean** of the :-

i). British Shoe sizes, $\overline{B}$, ii). Continental shoe sizes, $\overline{C}$.

c). Plot ($\overline{B}$, $\overline{C}$) on the scatter graph and indicate this point.

d). Draw in the **line of best fit** and comment on the type of correlation shown.

e). The equation of the line of best fit can be written as $C = aB + b$, where a and b are numbers. Find the values of a and b.

f). Use your formula to find the value of C when

i). B = 0, ii). B = 10, iii). B = 15.