

OCR

A Level

A Level Mathematics

Pearson's Correlation
Coefficient

Name:

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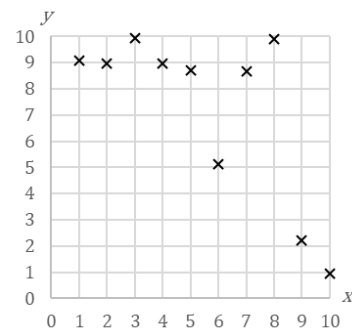
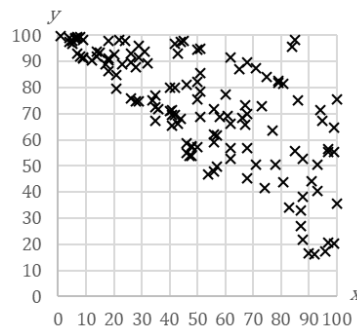
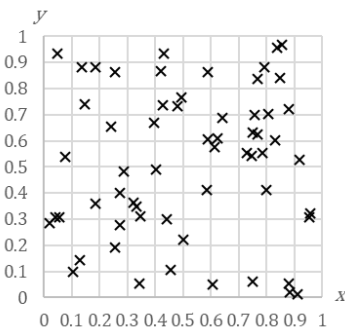
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Total Marks:

D1- Pearson's Correlation Coefficient- Questions

OCR

- 1) Estimate the correlation coefficient of the data shown in each of the following graphs. [3]



- 2) For each of the following determine whether $H_0: \rho = 0$ can be rejected or accepted and at what level of significance- either 5, 1, 0.1%.

	ρ	n	P-value
i)	0.73	-	0.0000169
ii)	0.86	-	0.0495
iii)	0.977	12	-

[1]

[1]

[6]

- 3) The results of a machine that learns from its mistakes are shown in the table below.

Number of Experiments	10	20	30	40	50	60	70	80	90	100
Accuracy	0	3	9	15	23	37	52	94	99	100

- i) Calculate Pearson's correlation coefficient. [4]
- ii) Write null and alternate hypotheses regarding the significance of the calculated coefficient. [2]
- iii) Carry out a t-test at the 5% significance level. Use this to reject or accept the null hypothesis. [4]
- iv) Plot a suitable graph of the data. [1]
- v) Without calculation state the effect, with a reason, that removing the first two pairs (10,0) and (20,3) would have. [1]
- vi) Assuming the Accuracy increases linearly between intervals calculate the Accuracy after 66 experiments. [2]
- vii) Explain why *Number of Experiments* is the independent variable. [1]