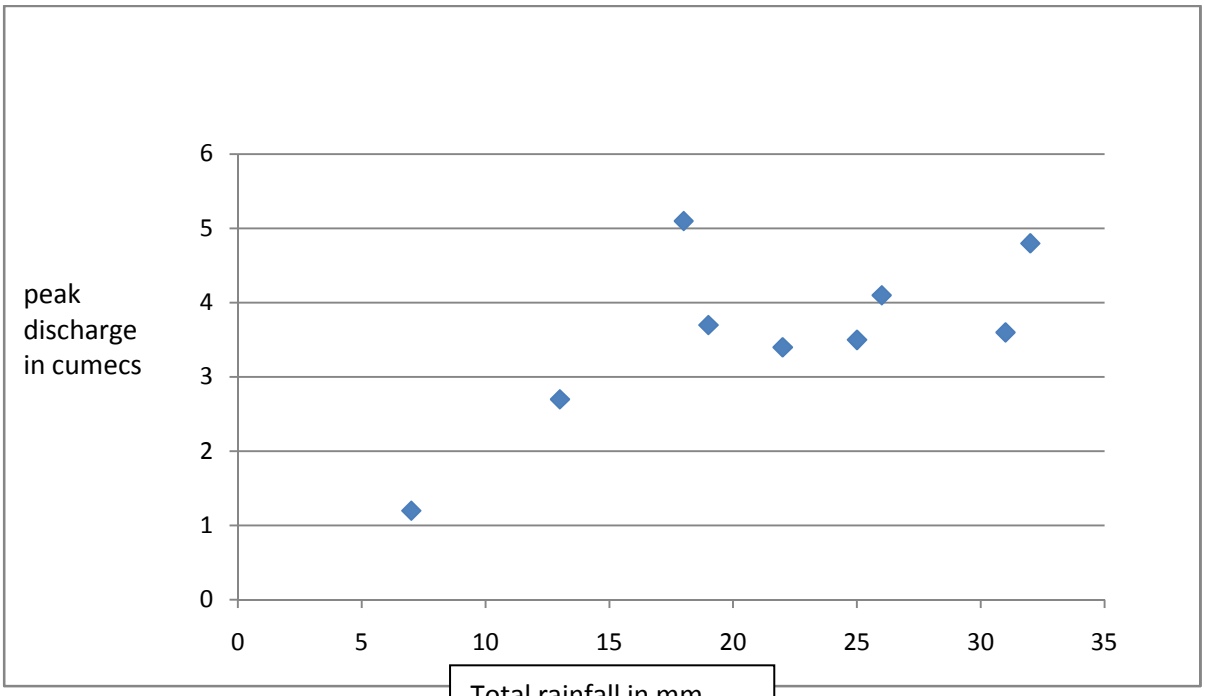
THE RELATIONSHIP BETWEEN TOTAL RAINFALL AND PEAK DISCHARGE

Rainfall and discharge data has been collected for a stream in the Lincolnshire Wolds. This has been done for 10 rainfall events.

The Null hypothesis is ...'There is no relationship between the total rainfall and the peak discharge.'

The data for 9 of the rainfall events have been plotted on a scattergraph



1. Plot the data for a 10th rainfall event on the graph above

Total rainfall 16mm peak discharge 2.2 cumecs

2. Describe and explain the relationship shown by the graph

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3. Draw a best fit line on the graph and highlight an anomaly.

4. In the table and the space below complete the calculation for Spearman's Rank Correlation Coefficient. Give the answer to 3 decimal places.

Total rainfall in mm	rank	Peak discharge in cumecs	rank	d	d^2
16	8	2.2	9	-1	1
13	9	2.7			
7		1.2	10		
19	6	3.7	4	2	4
32	1	4.8	2	-1	1
31		3.6	5		
18	7	5.1	1	6	36
26	3	4.1	3	0	0
25	4	3.5			
22	5	3.4	7	-2	4
				$\sum d^2$ =	60

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

5. Use the table below to comment on the result and what it means

Number of pairs of data	0.05 significance	0.01 significance
10	0.546	0.794

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6. Outline the factors other than the total rainfall that cause peak discharge of **this river** to vary.

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7. Outline the factors that cause differences in peak discharge for **different rivers** following similar rainfall events.

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