GIRTON SUMMER PROGRAMME

MATHEMATICS FOR ENGINEERING

STATISTICS: HOMEWORK QUESTIONS

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The Homework Answers sheet can be downloaded from Moodle. Once completed (for all five homeworks) is must be uploaded as a ".pdf".

Question: Statistics-1

Two similar machines are believed to have a probability of 0.88 of correctly manufacturing a particular component. On a particular day, machine A has produced 885 correct components out of a batch of 1000, whilst machine B has only produced 870 correct components out of 1000.

Estimate the +/- one standard deviation range (ie $\mu - \sigma$ to $\mu + \sigma$) for the number of correct components expected in a batch of 1000. Is there evidence to suggest machine B needs attention (yes/no)?

Enter your range and yes or no on the **Homework Answers sheet.**

Question: Statistics-2

A company has an old machine which produces spacers one at a time, each with a mean thickness of 5 mm and standard deviation of 0.1 mm. These spacers are sold in sets of five to customers who are only interested in the total thickness of the five spacers. It is proposed to replace the old machine with a new machine which produces five spacers simultaneously, each with exactly the same thickness, which is 5 mm but has a standard deviation of σ mm. What must be the maximum standard deviation of the thickness in the new machine to ensure that the set of five spaces is still satisfactory.

Enter the new standard deviation in the box on the **Homework Answers sheet.**