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# Bus 274: Further Statistics for Business

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## PROBLEM SHEET # 1

**Problem 1:** The weights of packages of ground beef are normally distributed with mean 1 kilo and standard deviation 0.05.

a) What is the probability that a randomly selected package weighs between 0.90 and 0.95 kilos? Find this probability, using the N(0,1) table.

b) We randomly choose 10 packages from the store. Find the distribution of the arithmetic mean of their weights.

c) Write the expression of the probability that the arithmetic mean in (b) is between 0.90 and 0.95 kilos, applying the correct standardization.

d) What is the weight of a package such that only 1% of all packages exceed this weight?

e) A customer complains that a package he bought weighed only 0.9 kilos. Is this an exceptionally low weight, considering the standard deviation? If you were the supermarket manager, what would be your reaction to this customer? Give reasons for your answer.

**Problem 2:** A fair dice is rolled 210 times. All we are interested in is whether the dice falls '6' or not.

a) Find the exact distribution of $X = \#$ times the dice falls '6'. (Give the values of all parameters.)

b) Which distribution can be used as an approximation? (Use the CLT. Give the mathematical expressions of all parameters.)

c) Using the distribution in (b), find the probability that '6' appears more than 40 times, standardizing correctly.

d) Give a business-related example which is similar to this dice-rolling experiment.