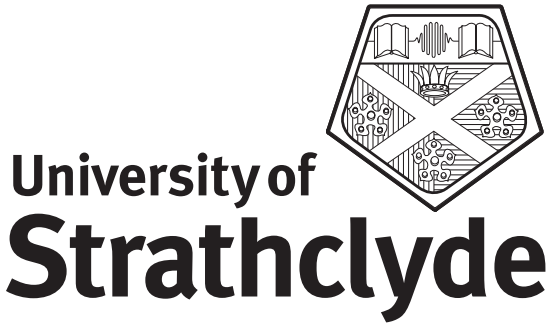

MM104/ MM106/ BM110

Topic 4: Normal Distribution
Percentiles

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Recap of Percentiles

A percentile is a measure indicating the value below which a given percentage of observations in a group of observations falls. For example, the 20th percentile is the value (or score) below which 20 % of the observations may be found.

Percentiles

A percentile is a number between 0 and 100. In order to use percentiles in calculations involving the normal distribution we need to convert them to probabilities. To convert a percentile to a probability, simply divide the percentile by 100.

Example 1

The proportion by weight of cats in an animal sanctuary is known to be Normally distributed with mean 4 kg and standard deviation 500 g. Find the 99.5 percentile.

We firstly need to keep units consistent: $\mu = 4, \sigma = 0.5$

We are interested in finding out a value of weight x such that

99.5 % of the cat's in the sanctuary have a weight below that value.

Mathematically: $\mathrm{P}(X < x) = 0.995$

Using the tables

$\underline{\underline{x = 5.287915\text{kg}}}$