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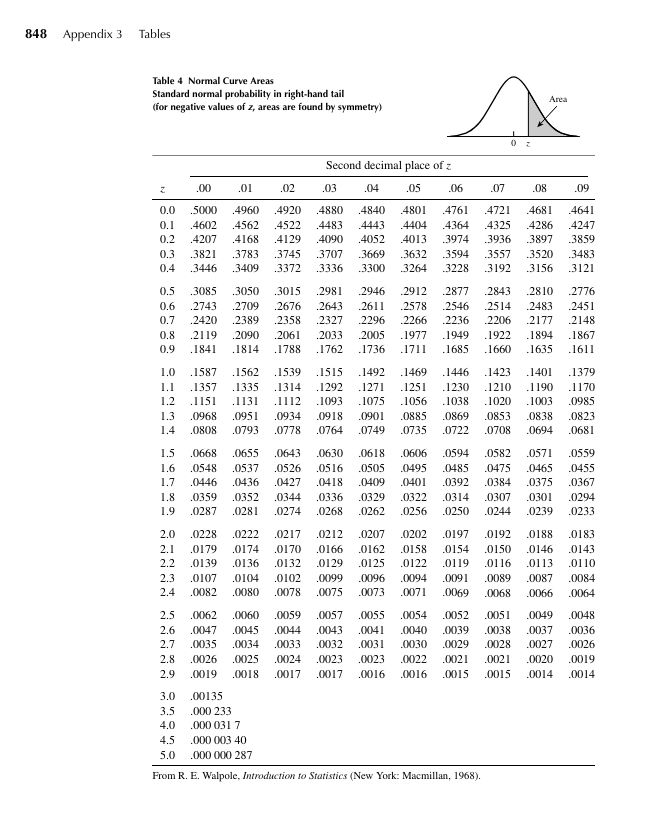
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Probability and Applied Statistics

Beta, Normal, and Gamma Distributions

# Normal

The Normal distribution, as defined by our textbook is given that . The textbook goes on to point out that and , as both and are present in the equation. The use cases for Normal Distribution are: finding the fraction of exam scores that fall between two grades, provided with the mean and standard deviation, finding variance of measurements, provided with a mean and standard deviation. An important note that the textbook makes is that, in order to compute certain Normal Distributions – Table 4, Appendix 3 must be referenced. Snippet of the page has been provided below. As well as a direct [link.](https://prnt.sc/xuzkvQQYBihm)



# Gamma

The Gamma Distribution is defined by the textbook as where . The textbook states Gamma Distribution is used for skewed probability. For example, the intervals between an airplane malfunction, or the interval between guests in a checkout line. Further examples include, the time to complete maintenance on a car engine, and time between patients seen at a doctors office. These results are considered skewed because they increase and decrease based upon a variety of factors. When computing a Gamma Distribution, is referred to as the shape parameter, where is referred to as the scale parameter. According to Definition 4.11 in the textbook, *exponential density function* is the gamma distribution when a = 1. where .

# Beta

The Beta Distribution is defined by the textbook as where . Where . The Beta Distribution is mostly used to model proportions, such as impurities in a chemical product, or proportion of time a machine is under repair. The Beta distribution graphs presented on page 195 display that the restrictive bound does not inherently limit the use of the distribution.The *incomplete beta function* is defined as .

# Works Cited

All information was obtained from the textbook used in class, **Mathematical Statistics with Applications**.