LOGM 634 - Homework Set #3

Due 17 January 2017

# From the Ebeling text - Exercise 6.3

# From the Ebeling text - Exercise 6.8

A contractor must decide between two different sump pump systems to be installed in a new housing development. The option is to install a single gallon per minute (gpm) system or two -gpm pumps. If the two-pump system is used, one pump carry most of the load in the event the other pump fails. Both of the -gpm pumps have an of hr when working together. Their individual is hr. The -gpm system has a rated of hr. Which system is preferred on the basis of system ? Which system has the best design life for a reliability of ?

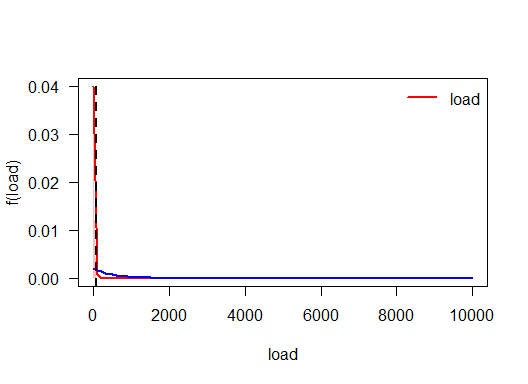
# From the Ebeling text - Exercise 6.14

# From the Ebeling text - Exercise 7.5 (Use Eqn 7.15)

# From the Ebeling text - Exercise 7.13 (Use Table 7.2 for constant strength)

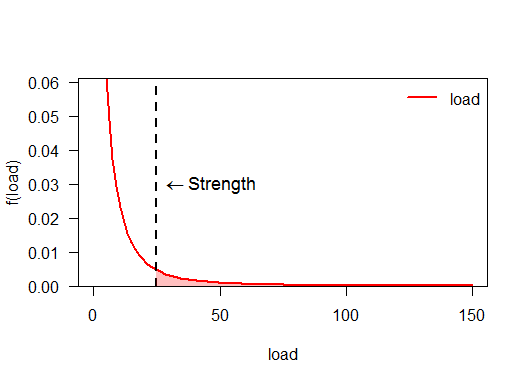
A load is exponentially distributed with a mean of 25. The strength is also exponentially distributed. Determine the minimum value of the mean strength to achieve a reliability of 0.95.

The figure below shows a plot of the density function for the applied load where . The vertical line represents or the load at which



# From the Ebeling text - Exercise 7.15 (Use Eqn. 7.11)

The breaking strength of a cutting tool is a constant lb. If the load being placed on the tool has the following probability density function, compute the tool's static reliability.



The static reliability is equal to the area under the load curve that is greater than , i.e.