

## TMA4275 Lifetime Analysis (Spring 2015)

### Exercise 7

#### Problem 1 – Accelerated Life Testing

One has observed the following 18 lifetimes (in days):

410, 483, 492, 124, 780, 264  
804, 1334, 1025, 1267, 327, 1581  
876, 804, 1582, 2801, 570, 2390

- a) Use MINITAB to estimate a Weibull model for the data, and create a plot that shows the fit to the model. Comment.
- b) The data are actually taken from three groups of components, where the conditions are somewhat different. The six first observations are in group 1, etc. From this is defined a stress variable  $s$  with three values, 1, 2 and 3, respectively, for group 1, 2 and 3. Try to identify an accelerated life model (ALT) which is appropriate for the data (using MINITAB). Create for example a “relation plot” and a “probability plot”. Explain what the plots tell us.
- b) Do you conclude that the ALT model in b) fits better than the pure Weibull model found in a)?

#### Problem 2 – A repairable pump

Exam June 2008: Problem 2.

#### Problem 3 – Valve seat replacements

Exam May 2013: Problem 2.