Term Test B version 2

(1)[5 points] A factory worker produces a mean of 91.1 units of a food product per hour with a standard deviation of 5.8 units. The distribution is normal. Determine the missing number x in the following statement: 79% of the time, the factory worker produces more than x units in an hour.

(2)[5 points] A bakery product maintains its quality for a mean of 140 hours after production with a standard deviation of 12 hours. The distribution is normal. The "best before" date is chosen such that 90% of the product maintain their quality by that date. How many hours after production should the "best before" date be set?

(3)[5 points] In a meat manufacturing plant, cattle are processed at a work station. On average, 0.66 cattle per hour create problems that cause an interruption in the work flow. Calculate the probability that a work station will experience strictly less than four interruptions on a given work day (eight hours).

(4)[5 points] A production cycle requires good weather. In September, based on many years of experience, 9 out of 13 days have good enough weather for the production cycle. Calculate the probability that on exactly four out of these five days the weather was good enough for the production cycle:
  September 5, 2011
  September 5, 2012
  September 5, 2013
  September 5, 2014
  September 5, 2015

(5)[5 points] A company that makes processed foods receives an ingredient in single units from a supplier. 22.7% of the ingredients are A-grade quality, 76.1% are B-grade quality, and the rest is spoiled. On Tuesday, the supplier drops off 800 units. Estimate (!) the probability that 12 or more units are spoiled.