Class examples

I.   The length of time to complete a door assembly on an automobile factory assembly line is distributed with mean $\mu = 7.0$ minutes and standard deviation $\sigma = 5.0$ minutes. What is the probability that the <u>mean assembly time</u> for a random sample of 100 doors will be:

   o **At least 6** minutes

   o **8** minutes or less

   o Between **6.0** and **6.5** minutes

   o Between **4.5** and **8** minutes

II.   The length of time to complete a door assembly on an automobile factory assembly line is normally distributed with mean $\mu = 7$ minutes and standard deviation $\sigma = 2.0$ minutes. For a door selected at random, what is the probability the assembly time will be:

   o **At most 5** minutes

   o **10** minutes or more

   o Between **4.5** and **6.5** minutes

   o Between **6** and **9** minutes

III. Studies for Jet Printers show the lifetime of the printer follows a normal distribution with mean $\mu = 5$ years and standard deviation $\sigma = 0.8$ years. The company will replace any printer that fails during the guarantee period.

   • **How long** should printers be guaranteed if the company wishes to replace **no more than 15%** of the printers?

   • **What fractions** of these printers will fail **before 3** years?

   • **If** the engineering specifications are 4.0 ± 1.5 years, **what is the probability** that a randomly selected jet printer **will not** meet specifications?

   • **Find the point** in the lifetime distribution, which **25%** of the printers **will not** exceed?

IV. As part of a quality control program at a factory, random samples of 36 6-ounce cans of juice are taken, and the contents carefully measured. When the manufacturing process is working properly, the cans are filled with an average of 6.04 oz of juice. The standard deviation is 0.02 oz. When the process is working properly, what is the probability a sample of 36 of the 6-oz cans of juice would contain an average of 6.03 oz or less?

V. The weight of corn chips dispensed into a 10–ounce bag by the dispensing machine has been identified as possessing a normal distribution with a mean of 10.5 ounces and a standard deviation of .2 ounces. Suppose 100 bags of chips were randomly selected from this dispensing machine. Find the probability that the sample mean weight of these 100 bags exceeded 10.45 ounces.