Chapter 4 Quiz – Number 6
X=price of gas
The population of X is normal with μ = $2.75 and σ = $0.40
Question: If you take a random sample of 50 gas stations and calculate the sample mean price, what is the probability that the sample mean is between $2.60 and $2.90.

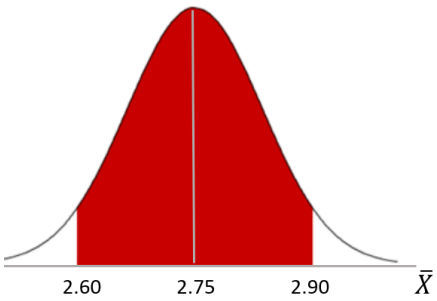
First: Describe the sampling distribution of the mean:

a. $\mu_{\bar{X}} = \mu = 2.75$

b. $\sigma_{\bar{X}} = {}^{\sigma}/_{\sqrt{n}} = {}^{0.40}/_{\sqrt{50}} = 0.056569$

c. The shape of the sampling distribution is normal because the population shape is normal (regardless of sample size)

Second: Given the characteristics of the sampling distribution, shade the area represented by the probability:

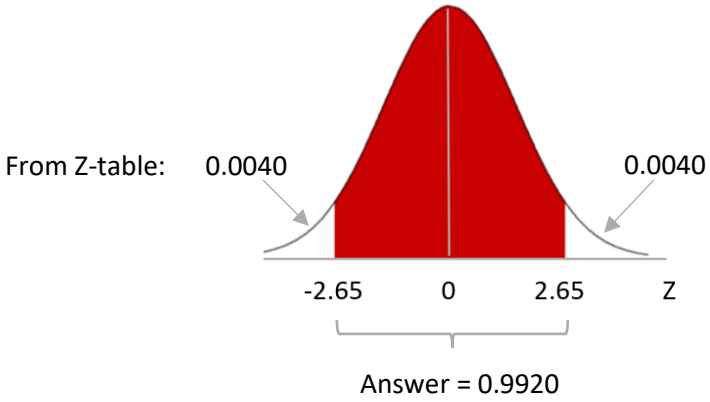


Third: Convert the sample means to Z-scores:

$$Z = \frac{\bar{X} - \mu_{\bar{X}}}{\sigma_{\bar{X}}} = \frac{2.60 - 2.75}{0.056569} = -2.65$$

$$Z = \frac{\bar{X} - \mu_{\bar{X}}}{\sigma_{\bar{X}}} = \frac{2.90 - 2.75}{0.056569} = +2.65$$

Third: Convert the sampling distribution to a Z-distribution and use the Z-table to find the probability:



Answer = 0.9920