

1. A bank's loan officer rates applicants for credit. The ratings are normally distributed with a mean of 200 and a standard deviation of 50. If an applicant is randomly selected, find the probability of a rating that is between 215 and 230.
2. If z is the standard normal distribution variable, find the probability that z is less than 1.13
3. The scores on a certain test are normally distributed with a mean score of 61 and a standard deviation of 3. What is the probability that if 80 students are randomly selected, their mean score will be at least 61.3162? (Use four decimal places when performing Computations)
4. Assume that women heights are normally distributed with a mean, $\mu = 63.6$ in. and a standard deviation $\sigma = 2.5$ in. If a woman is selected at random, find the probability that her height is between 59.1 in. and 66.6 in.
5. In one region, the September energy consumption levels for a single-family homes are found to be normally distributed with a mean of 1050 kWh and a standard deviation of 218 kWh. Find the 45th percentile (P_{45}) and the 75th percentile (P_{75}).
6. The lengths of human pregnancies are normally distributed with a mean of 268 days and a standard deviation of 15 days.
a) What is the probability that a pregnancy lasts at least 300 days? b) If 1 woman is randomly selected, find the probability that her length of pregnancy is less than 260 days? c) If 49 women are randomly selected, what is the probability that lengths of pregnancy have a mean less than 260 days?
7. Find the following Z-scores:
 - a) $Z_{0.025}$
 - b) $Z_{0.86}$
 - c) $Z_{0.005}$
8. Find the area under the standard normal curve that lies either to the left of -1.97 or to the right of 1.42
9. IQ scores are normally distributed with a mean of 100 and a standard deviation of 15. In a random sample of 4000, approximately how many people will have IQs between 85 and 120?
10. According to the US Energy Information Administration, the mean monthly fuel expenditure per household vehicle is \$ 58.80. The standard deviation is \$ 30.40. What is the probability that the sampling error made in estimating the mean monthly expenditure for fuel using a random sample of 60 such vehicles will be within \$ 6?
11. The starting salaries of college graduates has a mean of \$43,704 and a standard deviation of \$9769. Using sample size $n = 81$ and a 90% confidence level, find the margin of error and the confidence interval for the population mean.
12. Math SAT scores for women are normally distributed with a mean of 495 and a standard deviation of 107. Using sample size $n = 36$ and a 95% confidence level, find the margin of error and the confidence interval for the population mean.
13. A sample consists of 80 TV sets purchased a few years ago. The replacement times of those TV sets have a mean of 8.4 years and a standard deviation of 1.5 years. Construct a 94% confidence interval for the mean of replacement times of all TV sets.
14. By measuring the amount of time it takes a component of a product to move from one workstation to the next, an engineer has estimated that the standard deviation is 6 sec.
 - a) How many measurements should be made in order to be 99% certain that the maximum error of estimation will not exceed 1 sec?
 - b) What sample size is required for a maximum error of 2 sec?
15. How large a sample should be taken if the population mean is to be estimated with 99% confidence to within \$85? The population has a standard deviation of \$700.
16. Salaries of statistics professors are normally distributed. Using a sample size of 60, a sample mean of \$85,678 and standard deviation \$12,345 find the confidence interval for the population mean for 95% confidence level.
17. Construct the confidence interval for the population mean for salaries of airline pilots using the following : 99% confidence, sample mean \$97334, sample std. Dev. \$17747, $n = 100$