

Practice with Z-Scores and Normal Distribution

1. If the scores on a standardized test are normally distributed with a mean of 540 and a standard deviation of 65. Use your graphing calculator to find each probability. Round all probabilities to the nearest tenth of a percent.
 - (a) Find the probability that a test picked at random would have a score larger than 720.
 - (b) Find the probability that a test picked at random would have a score less than 500.
 - (c) Find the probability that a test picked at random would have a score between 500 and 600.
 - (d) Find the probability that a test picked at random would have a score between 600 and 700.

2. The average weight of full grown beef cows is 1470 pounds with a standard deviation of 230 pounds. If the weights are normally distributed, what is the percentile rank of a cow that weighs 1,750 pounds?
 - (1) 89th
 - (2) 76th
 - (3) 49th
 - (4) 35th

3. Given that the volume of soda in a 12 ounce bottle from a factory varies normally with a mean of 12.2 ounces and a standard deviation of 0.6 ounces, use your calculator to determine the probability that a bottle chosen at random would have a volume:
 - (a) Greater than 13 ounces
 - (b) Less than 11 ounces
 - (c) Between 11.5 and 12.5 ounces

4. The lifespan of a 60-watt lightbulb produced by a company is normally distributed with a mean of 1450 hours and a standard deviation of 8.5 hours. If a 60-watt lightbulb produced by this company is selected at random, what is the probability that its lifespan will be between 1440 and 1465 hours?
 - (1) 0.3803
 - (2) 0.4612
 - (3) 0.8415
 - (4) 0.9612

5. The heights of women in the United States are normally distributed with a mean of 64 inches and a standard deviation of 2.75 inches. The percent of women whose heights are between 64 and 69.5 inches, to the nearest whole percent, is
 - (1) 6
 - (2) 48
 - (3) 68
 - (4) 95

6. Two versions of a standardized test are given, an April version and a May version. The statistics for the April version show a mean score of 480 and a standard deviation of 24. The statistics for the May version show a mean score of 510 and a standard deviation of 20. Assume the scores are normally distributed. Joanne took the April version and scored in the interval 510-540. What is the probability, to the nearest ten thousandth, that a test paper selected at random from the April version scored in the same interval? Maria took the May version. In what interval must Maria score to claim she scored as well as Joanne?

7. At a local PTA meeting, a sample of parents were surveyed to determine how many children they currently had attending school. Their results are shown in the frequency table below:

Determine the mean, median, and standard deviation for this sample. Round any non-integer answers to the nearest tenth.

Number of Children	Number of Families
1	16
2	24
3	8
4	3
5	2
7	2

Determine how many of the 55 families surveyed have a number of children that was within one standard deviation of the mean. Show your analysis.

8. The scores on a standardized test that Jeremy took were normally distributed with a mean of 82 and a standard deviation of 5. On the test, Jeremy scored a 90.
 - (a) What percent of students scored better than Jeremy on this test? Round to the nearest tenth of a percent.
 - (b) If Lisa took the same test, at a different time, and the scores were again normally distributed with a mean now of 83 and a standard deviation of 6.4, then what score, to the nearest integer, would make her percentile rank the same as Jeremy's? Show how you arrived at your answer.