1. [5 pts.] Find the area of the shaded region under the standard normal distribution curve.

$$-1.38 \qquad 0 \qquad\qquad\qquad z$$
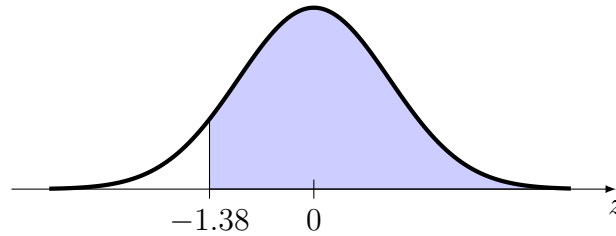
2. [10 pts.] Find the probability $P(0 < Z < 0.525)$, assuming the random variable Z has the standard normal distribution.

3. [10 pts. each] The alkalinity level of water specimens taken from the Han River in Seoul is normally distributed with a mean of 50 mg/L and a standard deviation of 3.2 mg/L. Find the probability that a water specimen taken from the river has an alkalinity level

   (a) exceeding 45 mg/L.

   (b) below 55 mg/L.

   (c) between 51 and 52 mg/L.

4. [10 pts.] Find the z-score that has 78.5% of the standard normal distribution's area to its right.

5. [10 pts. each] The annual per capita consumption of bananas (in pounds) in the U.S. can be approximated by a normal distribution, with mean of 10.4 pounds and standard deviation of 3 pounds.

   (a) What is the smallest annual per capita consumption of bananas that can be in the top 10% of consumption?

   (b) What is the largest annual per capita consumption of bananas that can be in the bottom 5% of consumption?

6. [15 pts.] During a certain week, the mean price of gasoline in California was $4.117 per gallon with a standard deviation of $\sigma = \$0.049$. A random sample of 38 gas stations is selected from this population. What is the probability that the mean price for the sample was between $4.128 and $4.143 that week?

7. [10 pts. each] About 35% of U.S. workers are college graduates. You randomly select 500 U.S. workers and ask them whether they are college graduates. Use the normal distribution to approximate the binomial distribution in finding the following probabilities.

   (a) The number of workers who have graduated from college is exactly 175.

   (b) The number of workers who have graduated from college is no more than 225.

8. [15 pts.] In 36 randomly selected seawater samples the mean NaCl concentration was 23 cm^3/m^3. Assume the population standard deviation is 6.7 cm^3/m^3. Construct the 90% and 95% confidence intervals for the population mean.

9. [10 pts.] In a random sample of nine computers, the mean repair cost was $173 and the standard deviation was $29.60. Assume the population is normally distributed and use the t-distribution to find the margin of error and construct a 98% confidence interval for the population mean.