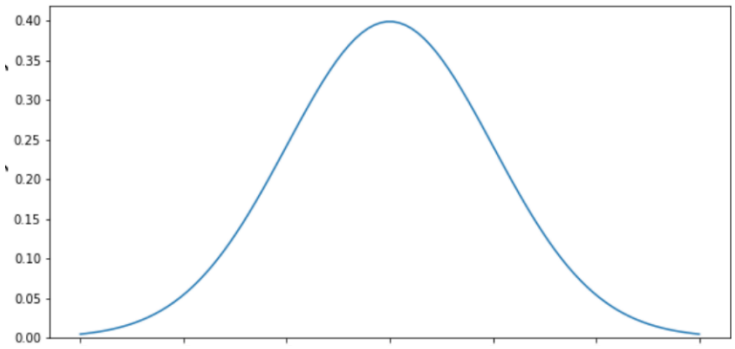
Problem 1

Suppose X is a continuous random variable. If P (X ≥ 16) = 0.03, then

1. P(X < 16) =
2. P (X ≤ 16) =
3. P(X > 16) =
4. P(X=16)=



Problem 2

Topics: continuous random variables, Normal distribution, empirical rule

Given an approximately normal distribution with a mean of 175 and a standard deviation of 37. Use the empirical rule.

5. Draw a normal curve and label 1, 2, and 3 standard deviations on both sides on the mean.
6. What percent of values are within the interval (138, 212)?
7. What percent of values are within the interval (64, 286)?

Problem 3

Topics: continuous random variables, Normal distribution, empirical rule

It is known that when a specific type of radish is grown in a certain manner without fertilizer the weights of the radishes produced are normally distributed with a mean of 40g and a standard deviation of 10g.

Determine the proportion of radishes grown. Use the empirical rule.

1. Without fertilizer with weights less than 50 grams.
2. Without fertilizer with weights between 20 and 60 grams.
3. Without fertilizer that will have weights greater than or equal to 60 grams.

[1] Math-UOttawa 2. UVermont 3 Utts [4] OpenIntro

Problem 4:

Topics: continuous random variables, Normal distribution, empirical rule

4. Which of the following would indicate that a dataset is **not** bell-shaped[3]?
   a. The range is equal to 5 standard deviations.
   b. The range is larger than the interquartile range.
   c. The mean is much smaller than the median.
   d. There are no outliers.
   e. None of the above

Problem 5

5. What is the z-score of x = 5 if it is 1.8 standard deviations below the mean?

Problem 6:

Topics: continuous random variable, standard normal distribution, probability, use of the Z table

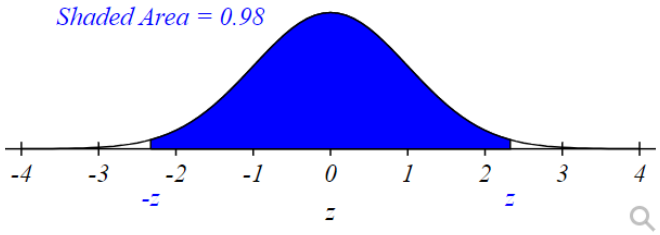
6. What percent of a standard normal distribution N(μ =0, σ= 1) is found in each region? Be sure to draw a graph

   a. $Z < 1.35$
   b. $Z > 1.48$
   c. $0.4 < Z < 1.5$
   d. $Z < -20.92$ or $Z > 20.97$

Problem 7:

7. Using the standard normal distribution, find the two z-scores that form the middle shaded region. The shaded region is symmetric about z = 0, Round your z-scores to two decimal places.

[1] Math-UOttawa 2. UVermont 3 Utts [4] OpenIntro



Problem 8:

Topics: histogram, Normal approximation to data, Normal probability plot, Q-Q plot

8. Can we approximate poker winnings by a normal distribution? We consider the poker winnings of an individual over 50 days. A histogram and normal probability plot of these data are shown in the following figure[4]:

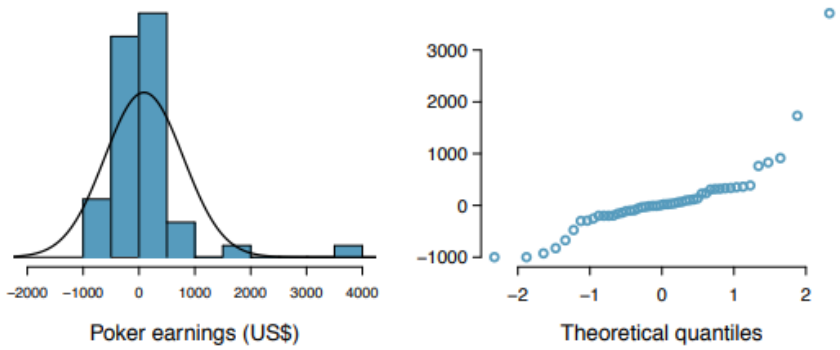


Figure 3.13: A histogram of poker data with the best fitting normal plot and a normal probability plot.

Problem 9

9. Overweight baggage. Suppose weights of the checked baggage of airline passengers follow a nearly normal distribution with mean 45 pounds and standard deviation 3.2 pounds. Most airlines charge a fee for baggage that weigh in excess of 50 pounds[4]. Determine what percent of airline passengers incur this fee.

[1] Math-UOttawa 2. UVermont 3 Utts [4] OpenIntro

Problem 10

The cholesterol content of large chicken eggs is normally distributed with a mean of 200 milligrams and standard deviation 15 milligrams.

10. What is the probability that the cholesterol content of a random egg is less than 205 milligrams?

11. In sixty-seven percent of the eggs, the cholesterol content is less than a certain value "C".
    Find the value of "C".
    a) 0.33
    b) 206.6
    c) 210
    d) 0.44
    e) 193.4

Problem 11

Topics: Normal distribution, parameters of the normal distribution, z-score, quartiles, use of the Z table

Auto insurance premiums. Suppose a newspaper article states that the distribution of auto insurance premiums for residents of California is approximately normal with a mean of $1,650. The article also states that 25% of California residents pay more than $1,800.

12. What is the z-score that corresponds to the top 25% of the standard normal distribution?
13. What is the mean insurance cost? What is the cutoff for the 75th percentile?
14. Identify the standard deviation of insurance premiums in LA.