

1. Statistical Abstracts provides information about state per capita income taxes. The distribution is mound shaped with a mean of \$1,701 and a standard deviation of \$672.
 - (a) Use the empirical rule to find an interval centered about the mean in which about 68% of the data will fall.

 - (b) Estimate a range of values centered about the mean in which about 95% of the data will fall.

2. Jan earned 86 on her political science midterm and 82 on her chemistry midterm. In the political science class the mean score was 80 with a standard deviation of 4. In the chemistry class the mean score was 70 with a standard deviation of 6.
 - (a) Convert each midterm score to a standard z score.

 - (b) On which test did she do better compared to the rest of the class?

3. The Snack Pack of potato chips is advertised to weigh 3.5 oz. The weights are normally distributed with a mean of 3.5 oz. and a standard deviation of 0.2 oz. A Snack Pack of potato chips is selected at random. Find the probability that it weighs less than 3.0 oz. or more than 3.7 oz.

4. Researchers at a pharmaceutical company have found that the effective time duration of a safe dosage of a pain relief drug is normally distributed with $\mu = 2.5$ hours and $\sigma = 0.4$ hours. For a patient selected at random, what is the probability that the drug will be effective for 2.75 hours or less?

5. The life of the Corn Delight popcorn maker is normally distributed with a mean of 20 months and a standard deviation of 2 months. The manufacturer will replace a Corn Delight popper if it breaks during the guarantee period.
 - (a) If the manufacturer guarantees the popper for 18 months, what percent of the poppers will he probably have to replace?

 - (b) How long should the guarantee period be if the manufacturer does not want to replace more than 3% of the poppers?

6. On Professor Grindstone's final exam the mean score was 72 and the standard deviation was 10. He wants to "curve" the exam so that the middle 50% of the students get C's.
 - (a) Find a z score for which the area under the standard normal curve from $-z$ to z is 50%.

 - (b) Find the range of scores which will be assigned a grade of C.

7. The life of one species of poplar tree is normally distributed with a mean of 20 years and a standard deviation of 2.3 years. Find the probability that a random sample of 9 trees will have a sample mean life span of over 21 years.

8. Among workers aged 20 to 24, 26% work more than 40 hours per week. If we randomly select 425 workers aged 20 to 24, find the probability that the number who work more than 40 hours per week is between 75 and 90 inclusive.

9. Based on US Bureau of the Census data, 12% of the men in the United States have earned bachelor's degrees. If 150 US men are randomly selected, find the probability that no more than 30 of them have a bachelor's degree.

1. Determine if the following data set is normal:

10.87	11.00	11.17	12.31	13.06	13.35	13.52	13.85	14.76	14.80
14.82	14.87	14.91	15.62	15.67	15.94	15.98	16.00	16.67	17.16
17.24	18.08	18.83	19.52	20.20					

2. Determine if the following data set is normal:

2	3	4	5	5	7	7	7	9	10	11
12	13	14	14	14	16	16	18	18	19	19
19	20	20								

3. Determine if the following data set is normal:

26	21	25	28	18	19	33	32	21	27	22
19	16	24	30	21	24	27	20	29	30	28
25	25	32								

4. The number of shark attacks per year in the United States is distributed approximately normal with a mean of 31.8 and a standard deviation of 10.0, according to data obtained from the Florida Museum of Natural History.

- What percent of years will have fewer than 30 shark attacks?
- What percent of years will have more than 40 shark attacks?
- In 2000, there were 51 shark attacks in the United States. Is this an unusually high number of attacks? Why?

5. Since 1900, the magnitude of earthquakes that measure 0.1 or higher on the Richter Scale in California is distributed approximately normally, with a mean of 6.2 and standard deviation of 0.5, according to data obtained from the United States Geological Survey.

- Determine the 40th percentile of the magnitude of earthquakes in California.
- Determine the magnitude of earthquakes that make up the middle 85% of magnitudes.

1. The heights of men are normally distributed with a mean of 69.0 in. and a standard deviation of 2.8 in. Find the percentage of men who have heights below 64 in., the minimum for men in the US Marine Corps.
2. To be eligible for the US Marine Corps, a woman must have a height of between 58 in. and 73 in. The heights of women are normally distributed with a mean of 63.6 in. and a standard deviation of 2.5 in. Find the percentage of women who satisfy that requirement.
3. Assume that body temperatures of normal healthy persons are normally distributed with a mean of 98.2°F and a standard deviation of 0.62°F. If we define a fever to be a body temperature above 100°F, what percentage of normal and healthy persons would be considered to have a fever?
4. On one measure of attractiveness, scores are normally distributed with a mean of 3.93 and a standard deviation of 0.75. What percent of the population has a measure of attractiveness greater than 2.75?
5. Scores on an anti-aircraft exam are normally distributed with a mean of 99.56 and a standard deviation of 25.84. For a randomly selected subject, find the probability that a score will fall between 110.00 and 150.00.
6. For a certain population, scores on the Miller Analogies Test are normally distributed with a mean of 58.84 and a standard deviation of 15.94. If subjects who score below 27.00 are to be given special training, what is the percentage of subjects who will be given the special training?
7. Scores on the biology portion of the Medical College Admissions Test are normally distributed with a mean of 8.0 and a standard deviation of 2.6. Among 600 individuals taking this test, how many are expected to score between 6.0 and 7.0?
8. The Chemco Company, which manufactures car tires, finds that the tires last distances that are normally distributed with a mean of 35,600 mi. and a standard deviation of 4275 mi. The manufacturer wants to guarantee the tires so that only 3% will be replaced because of failure before the guaranteed number of miles. For how many miles should the tires be guaranteed?
9. One classic use of the normal distribution is inspired by a letter to Dear Abby in which a wife claimed to have given birth 308 days after a brief visit from her husband, who was serving in the Navy. The lengths of pregnancies are normally distributed with a mean of 268 days and a standard deviation of 15 days. Given this information, what percent of the population would have a pregnancy lasting 308 days or longer? What does the result suggest?