

1. The weekly wages of the six employees at Harold's Hardware Store are
\$300, \$320, \$380, \$420, \$500, and \$2000
 - a. Find the mean and standard deviation of this distribution.
 - b. How many workers earn wages within 1 standard deviation of the mean?
 - c. How many earn wages within 2 standard deviations of the mean?
2. If a normal distribution has mean 50 and standard deviation 4, find the following Z -scores:
 - a. For $x = 46$.
 - b. For $x = 60$.
3. **Life of Light Bulbs** A certain type of light bulb has an average life of 500 hours, with a standard deviation of 100 hours. The length of the bulb can be closely approximated by a normal curve. An amusement park buys and installs 10,000 such bulbs. Find the total number that can be expected to last for each of the following periods of time:
 - a. At least 500 hours
 - b. Between 650 and 780 hours
 - c. Less than 740 hours
4. At the Discount Market, the average weekly grocery bill is \$52.25, with a standard deviation of \$19.50. What are the largest and smallest amounts spent by the middle 50% of this market's customer?
5. Find the following areas under the standard normal curve:
 - a. Between $Z = 1.53$ and $Z = 2.82$
 - b. To the left of $Z = 0.41$

6. **Quality Control** A machine that fills quart orange juice cartons is set to fill them with 32.1 oz. If the actual contents of the cartons vary normally (normal distribution), with a standard deviation of 0.1 oz, what percent of the cartons contain less than a quart (32 oz)?
7. **Food Consumption** Under certain appropriate assumptions, the probability of a competing young animal eating x units of food is binomially distributed, with n equal to the maximum number of food units the animal can acquire, and p equal to the probability per time unit that an animal eats a unit of food. Suppose $n = 120$ and $p = 0.6$.
- Find the probability that an animal consumes at least 80 units of food.
 - Suppose the animal must consume at least 70 units of food to survive. What is the probability that this happens?
8. A normal distribution has a mean of 25 and a standard deviation of 5.
- What proportion of the scores fall between 20 and 30?
 - What proportion of the scores will lie above 35?
9. Bob got an 89 on the final exam in math and a 79 on the sociology exam. In the math class the average grade was 79 with a standard deviation of 5, and in the sociology class the average grade was 72 with a standard deviation of 3.5. Assuming that the grades in both subjects were normally distributed, in which class did Bob rank higher?
10. From past experience a teacher knows that the test scores of students taking an exam have a mean of 75 and a variance of 25. What can be said about the probability that a student will score between 65 and 85?