

The Normal Distribution & Percentiles

Section 11.5

1. The weights of adult male greyhound dogs are normally distributed. The mean weight is about 68.3 pounds and the standard deviation is about 8.6 pounds.
 - a) Approximately what percent of adult male greyhound dogs would you expect weigh more than 90 pounds?
 - b) What would you expect an adult greyhound dog to weigh if its weight is less than the lower 0.15% of weights of adult greyhounds?
 - c) Approximately what would you expect an adult male greyhound dog to weigh if its weight is in the 76th percentile of all adult greyhounds?
2. In a normal distribution of test scores with a mean equal to 57 and a standard deviation equal to 6.5, what is the percentile rank associated with a score of 70?
3. IQ scores are normally distributed with a mean of 100 and standard deviation of 16. What minimum IQ score represents the 84th percentile?
4. Masses of bags of chips have a mean of 30 grams, with a standard deviation of 4 grams, distributed normally.
 - a) What percentage of bags has a mass above 32.5 grams?
 - b) Any bag that is below the 16th percentile is thrown out. What mass would get a bag thrown out?
5. In a data set, the data value 84.5 corresponds to a z-score of 1 and the data value 71 corresponds to a z-score of -2. What is the mean and standard deviation of this data set?

6. A machine is used to fill soda bottles. The amount of soda dispensed into each bottle varies slightly. Suppose the amount of soda dispensed into the bottles is *normally distributed*. If at least the middle 99% of the bottles must have between 585 and 595 milliliters of soda, find the greatest standard deviation, to the *nearest hundredth*, that can be allowed.
7. Entry to a certain university is determined by a national test. The scores on this test are normally distributed with a mean of 500 and a standard deviation of 100. Tom wants to be admitted to this university and he knows that he must score better than at least 70% of the students who took the test. Tom takes the test and scores 585.
- a) Will he be admitted to this university?
- b) What is the lowest score Tom could receive and be accepted, to the nearest whole number?
8. The characteristics of speed and strength are considered to be of equal importance to the team in selecting a player for an open position. Using the data from the table below, which player should the team select if the team can only select one of the two players? Justify your answer.

	Mean	Standard Deviation	Player A	Player B
Time to run 40 yards	4.60 seconds	0.15 seconds	4.42 seconds	4.57 seconds
Amount of weight lifted	310 pounds	25 pounds	370 pounds	375 pounds

9. A temporary employment agency administers a typing test to all prospective employees to assess each person's typing speed. They find that the typing speeds are normally distributed with a mean of 43 words per minute, and a standard deviation of 3.2 words per minute. For a receptionist job, the agency decides not to recommend any applicants whose typing speed is in the lowest 30% of speeds. For a data entry job, the agency decides not to recommend any applicants whose typing speed is in the lowest 45% of speeds. What is the minimum typing speed required in order to be recommended for each type of job?