

1. A buyer for a lumber company must decide whether to buy a piece of land containing 5,000 pine trees. If 1,000 of the trees are at least 40 feet tall, the buyer will purchase the land; otherwise, he will not. The owner of the land reports that the heights of the trees have a mean of 30 feet and a standard deviation of 3 feet. Based on this information, what is the buyer's decision?
2. Suppose a light bulb manufacturer claims that the mean lifetime of its bulbs is 35 hours. Assume the bulb lifetimes have a mound-shaped distribution with a standard deviation of 5 hours.
 - a) If the manufacturer's claim is true, what percent of the light bulbs will burn out in less than 20 hours?
 - b) Suppose you randomly select one of the bulbs and it burns out in less than 20 hours. Do you suspect the manufacturer's claim is incorrect? Justify your answer.
 - c) What percentage of bulbs can be expected to burn out between 30 and 45 hours?
3. A professor believes that if a class is allowed to work on an examination as long as desired, the times spent by the students would be approximately mound-shaped with a mean of 40 minutes and a standard deviation of 6 minutes. Approximately how long should be allotted for the examination if the professor wants almost all, say 97.5% of the class to finish?