Using the Standard Normal PDF . . .

1. Suppose that the weights of U.S. adult males are normally distributed with a mean of 180 and a standard deviation of 12 pounds.

   a) What percent of the men weigh 190 pounds or more?
   b) What percent of the men weigh less than 160 pounds?
   c) What percent of the men differ from the mean by at least 35 pounds?
   d) Find an interval, centered at the mean, that includes the middle 50 percent of the weights.
   e) What weight is exceeded by only 5 per cent of the weights?

2. The grades on a statistics quiz were 0, 1, 2, ..., 10. The mean grade was 7.2 and the standard deviation was 1.2. If the grades were normally distributed, find

   a) the percent of students scoring 7 points.
   b) the highest grade for the lowest $33\frac{1}{3}\%$ of the class.
   c) the lowest grade for the highest 15% of the class.

3. The mean grade on an examination was 75 and the standard deviation was 10. The top 10% of the class will receive A's. What is the lowest grade that a student can score and still receive an A?

4. A certain machine manufactures steel balls. The diameters of the balls are normally distributed with a mean of 0.3456 inches and a standard deviation 0.0078 inches. Find the percent of balls with diameters

   a) between 0.3000 and 0.3090 inches.
   b) greater than 0.3560 inches.
   c) less than 0.3232 inches.

5. In the manufacture of certain light bulbs, it is found that 2% are defective. Assuming a normal distribution for defectives in lots of 1,000 of these bulbs, what is the probability that 15 will be defective if $\sigma = 3$?

6. The average wage in a certain industry is $4.75 per hour with a standard deviation of 50 cents. If wages follow a normal distribution, what per cent of the employees receive wages between $4.00 and $5.50 per hour?
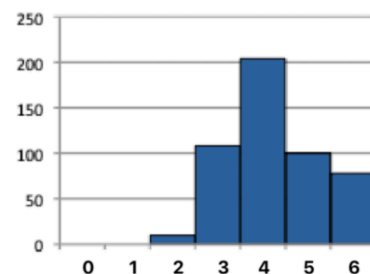
7. The average life of a certain appliance is 36 months with a standard deviation of 6 months. Assuming a normal distribution, what is the probability that these appliances should be expected to last from 27 to 41 months?

8. The grade point averages (GPA's) of a group of college students are normally distributed with $\mu = 2.3$ and $\sigma = 0.6$. What per cent of these students will have a GPA

      a) less than 1.5?   **b)** greater than 3.2?

9. A new antibiotic is tested on a group of six patients in each of 125 hospitals. The number of positive responses among the patients in each hospital is shown below.

Number of Positive Responses	Number of Hospitals	Number of Positive Patients
0	0	0
1	0	0
2	5	10
3	36	108
4	51	204
5	20	100
6	13	78
	125	500

6	patients/hospital
125	hospitals
750	total patients

      a) What is the probability that a patient will have a positive response?

      b) What is $P[X = 6]$?

      c) What is $P[X \le 3]$?

      d) What is $P[X > 2]$?

10. (Geometric) Suppose the probability that someone will make a major mistake on an income tax return is 0.08. One day , an IRS agent plans to audit as many returns necessary until she finds one with a major mistake. What is the probability that a major mistake will be found on the first return? The second? The third? The fourth? The fifth?