More Chapter 5, 6 and 7 Practice Problems

CHAPTER 5

1.   An increasing number of consumers believe they have to look out for themselves in the marketplace. According to a survey conducted by the Yankelovich Partners for a popular magazine, 50% of all consumers have called an 800 or 900 telephone number for information about some product. Suppose a random sample of 20 consumers is contacted and interviewed. What is the probability that 15 or more of these consumers have called an 800 or 900 telephone number for information about some product?

ANSWER: 2.07%

2.   AMR is a computer-consulting firm. The number of new clients that they have obtained each month has ranged from 0 to 3. The number of new clients has the probability distribution that is shown below.

Number of New Clients	Probability
0	0.10
1	0.30
2	0.20
3	0.40

Assume the expected value is 1.90 clients per month. Calculate the variance for this probability distribution.

ANSWER: Variance = 1.09

CHAPTER 6

3.   Runzheimer International publishes business travel costs for various cities throughout the world. In particular, they publish per diem totals, which represent the average costs for the typical business traveler including three meals a day in business-class restaurants and single-rate lodging in business-class hotels. If the average per diem is $409 and the standard deviation of per diem costs is $36, then 86.15% of the per diem costs in Tokyo, Japan will be more than what amount?

ANSWER: 86.15% of the per diem costs is Tokyo, Japan will be more than $369.76.

4.   According to the Internal Revenue Service, income tax returns one year averaged $1332 in refunds for taxpayers. One explanation of this figure is that taxpayers would rather have the government keep back too much money during the year tan to owe it money at the end of the year. Suppose the average amount of tax at the end of a year is a refund of $1332, with a standard deviation of $725. Assume that amounts owed or due on tax returns are normally distributed. What proportion of tax returns show a refund greater than $2000?

ANSWER: 17.88% of the tax returns will have a refund greater than $2000.

5.   The load time of web pages is measured in seconds. The average web page load time is 7.1 seconds with a standard deviation of 2 seconds. The top 11% of web pages can be expected to load in minimum of how many seconds?

ANSWER: The top 11% of web pages can be expected to load in minimum of 9.56 seconds.

6.   Many manufacturing problems involve the accurate matching of machine parts such as shafts that fit into a value hole. A particular design requires a shaft with an average diameter of 22 mm and a standard deviation of .005 mm. Calculate the maximum diameter that 16% of the shafts will have?

ANSWER: The maximum diameter that 16% of the shafts will have is 21.9951 mm.

7.   The load time of web pages is measured in seconds. The average web page load time is 7.1 seconds with a standard deviation of 2 seconds. Seventy-two percent of web pages can be expected to load in minimum of how many seconds?

ANSWER: Seventy-two percent of web pages can be expected to load in minimum of 5.94 seconds.

8.   Many manufacturing problems involve the accurate matching of machine parts such as shafts that fit into a value hole. A particular design requires a shaft with an average diameter of 22 mm and a standard deviation of .005 mm. Calculate the maximum diameter that 96% of the shafts will have?

ANSWER: The maximum diameter that 96% of the shafts will have is 22.0088 mm.

9.   Tool workers are subject to work-related injuries. One disorder, caused by strains to the hands and wrists, is called carpal tunnel syndrome. It strikes as many as 23,000 workers per year. The U.S. Labor Department estimates that the average cost of this disorder to employers and insurers is approximately $30,000 per injured worker. Suppose these costs are normally distributed, with a standard deviation of $9,000. Fifty-three percent of the costs can be expected to exceed what amount?

ANSWER: Fifty-three percent of the costs can be expected to exceed $29,280.

CHAPTER 7

10.   According to a study by Decision Analyst, 21% of the people who have credit cards are very close to the total limit on the card(s). Suppose a random sample of 600 credit card users is taken. What is the probability that more than 150 credit card users are very close to the total limit in their card(s)?

ANSWER: There is a 0.8% chance that more than 25% of the credit card users are very close to their limit based on a sample size of 600.

11.   The average cost of a one-bedroom apartment in a town is $550 per month. What is the probability of randomly selecting a sample of 50 one-bedroom apartments in this town and getting a sample mean between $530 and $555 if the population standard deviation is $100?

ANSWER: There is a 55.75% chance that the cost of a one-bedroom apartment will be between $530 and $555 based on a sample of size 50.