1. What percentage of the area under the normal curve lies
2. To the left of the mean?
3. Between μ – 2σ and μ + 2σ?
4. More than three standard deviations above the mean?

2. Over an entire summer, an amusement park gets an average of 21.7 people per day that have to go to the infirmary. Some days it is higher than this. Some days it is lower than this. The standard deviation is 4.2. The distribution for the amount of people treated is approximately normal.

1. For a ten day period, here are the number of people treated each of those ten days:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Number treated | 25 | 19 | 17 | 15 | 20 | 24 | 30 | 19 | 16 | 23 |

Make a control chart for the daily number treated, and plot this data on that chart. Do the data indicate that the number of people treated is “in control”? Explain your answer.

1. For a ten day period, here are the number of people treated each of those 10 days:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Number treated | 20 | 15 | 12 | 21 | 24 | 28 | 32 | 36 | 35 | 37 |

Make a control chart for the daily number treated, and plot this data on that chart. Do the data indicate that the number of people treated is “in control”? Explain your answer.

1. A normal distribution has mean = 12 and standard deviation = 3.
2. The z-score corresponding to x = 18.
3. Find the raw score corresponding to z = -1.5.

4. John received an 85 percent on a history test and a 78 percent on a Spanish test. For the history test, the class mean was 82 percent and standard deviation 10. For the Spanish test, the class mean was 74 percent and standard deviation 2. On which test did he do better relative to the rest of the class?

5. Find the specified areas under the standard normal curve:

1. To the left of z = .56
2. To the right of z = 1.3
3. To the right of z = -2.2
4. Between z = -1.2 and z = 2.1
5. P(-1.78 < z < -1.23)

6. If the mean of a normal distribution is 40 and the standard deviation is 4, find P(38 < x < 46).

7. Find z such that...

1. 10% of the standard normal curve lies to the right of z.
2. 90% of the standard normal curve lies between -z and z.

8. A local band is going on a U.S. Summer tour, and they average about 2000 people per concert, with a standard deviation of about 400. Assume that these concert numbers follow a normal distribution.

1. If a concert is selected at random, what is the probability that there were more than 2500 people at that concert?
2. If a concert is selected at random, what is the probability that there were less than 1800 people at that concert?
3. If a concert is selected at random, what is the probability that there were between 1800 and 2500 people at that concert?
4. For a concert to be in the top 10% as far as attendance, at least how many people would need to attend the concert?

9. Define what a sample statistic is. Give three examples from your everyday life of sample statistics.

10. Define what a sampling distribution is. Using one of your three examples from the previous problem, explain a possible sampling distribution from that example.

11. Define what the standard error of a sample distribution is.

12. The heights of 18 year old females are approximately normally distributed with a mean of 64 inches and a standard deviation of 3 inches.

* 1. What is the probability that an 18-year-old woman selected at random is between 63 and 65 inches tall?
  2. Suppose samples of 25 18-year-old females are taken at a time. Describe the sampling distribution of the sample mean and compute the mean and standard deviation of this sampling distribution.
  3. Find the z-score corresponding to a sample mean of 66 inches for a sample of 25 females.
  4. Find the probability that a sample mean from a sample like this would be higher than 66 inches.
  5. Based on the probability found in the previous part, would a sample like this be unusual?
  6. If a random sample of 25 18-year-old females is selected, what is the probability that the mean height for this sample is between 63 and 65 inches?