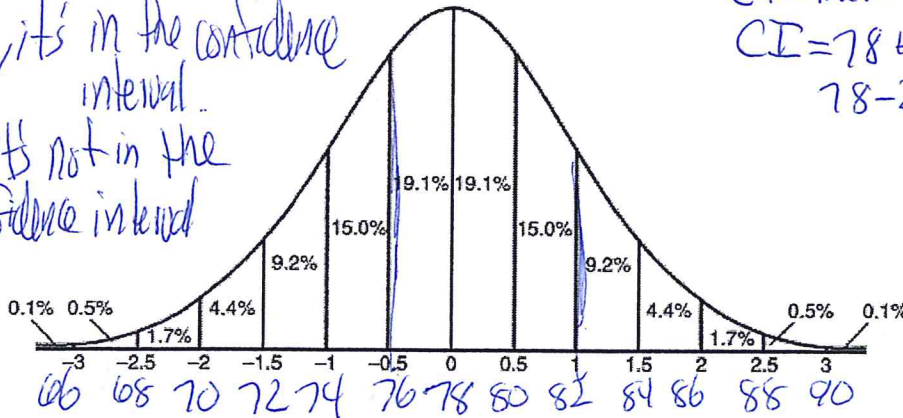


Normal Distribution Curve

1. On a standardized test, the results are normally distributed, the mean is 78 and the standard deviation is 4. What is the confidence interval? Is a score of 71 plausible? Is a score of 98 plausible? What is the probability that a randomly selected score is between 76 and 82?

71: Yes, it's in the confidence interval.

98: No, it's not in the confidence interval.



2. On a test that has a normal distribution of scores, 82 is the mean and the standard deviation is 2. What is the confidence interval? Is a score of 97 plausible? Is a score of 81 plausible? What is the probability that a randomly selected score will be between 78 and 84?

Handwritten calculations for problem 2:

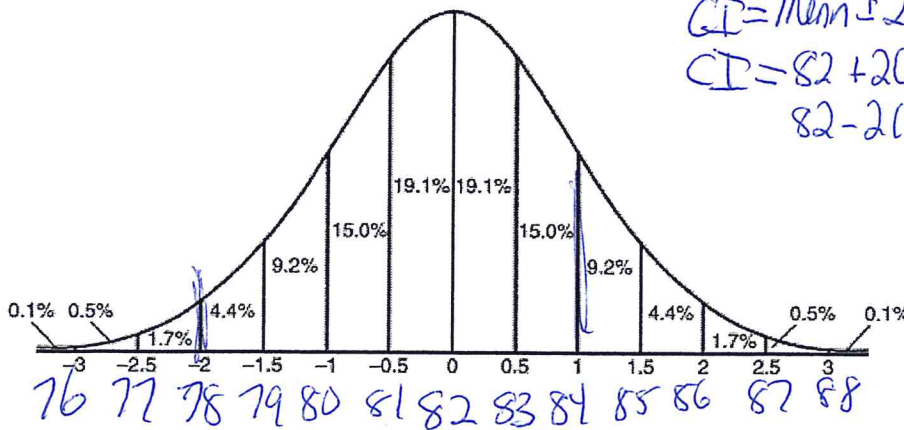
$$CI = \text{mean} \pm 2(\text{standard deviation})$$

$$CI = 82 + 2(2) = 86$$

$$82 - 2(2) = 78 \quad [78, 86]$$

97: No, it's not in the confidence interval.

81: Yes, it's in the confidence interval.

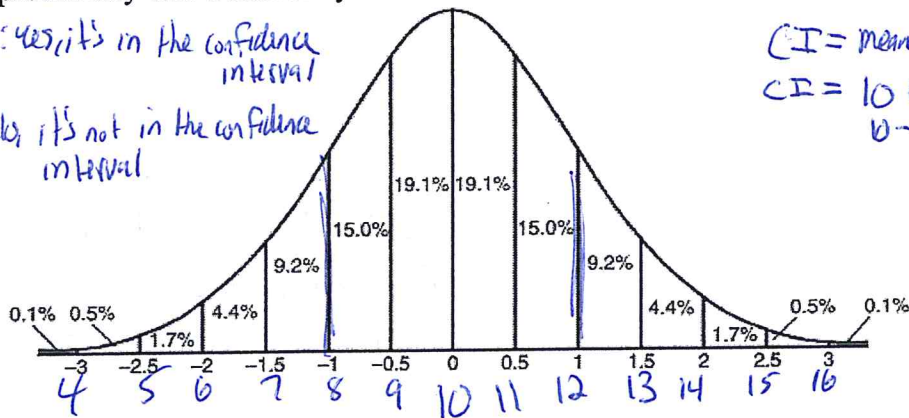


Handwritten calculations for problem 2:

$$4.4 + 9.2 + 15.0 + 19.1 + 19.1 + 15.0 = 81.8\%$$

3. If the amount of time students work in any given week is normally distributed with a mean of 10 hours per week and a standard deviation of 2 hours, what is the confidence interval? Is a time of 13.5 hours plausible? Is a time of 18.1 hours plausible? What is the probability that a randomly selected student will work between 8 and 12 hours?

13.5: yes, it's in the confidence interval
18.1: No, it's not in the confidence interval



CI = mean \pm 2(standard deviation)

CI = 10 + 2(2) = 14
10 - 2(2) = 6

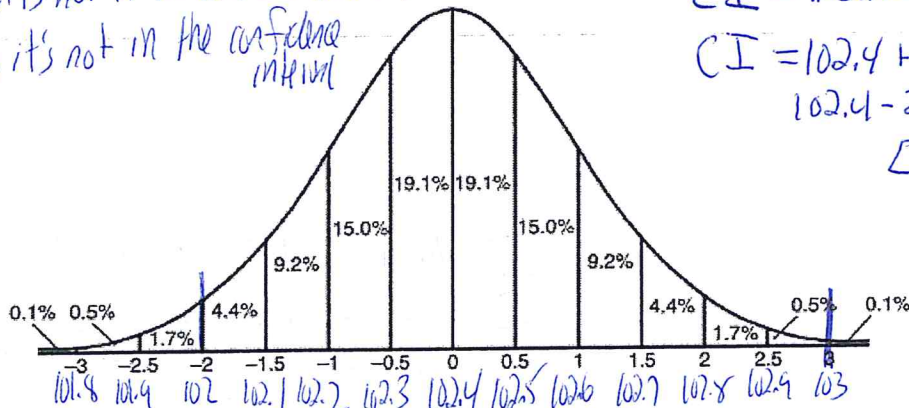
[6, 14]

15
+19.1
+19.1
+15

68.2%

4. The lengths of 100 pipes have a normal distribution with a mean of 102.4 inches and a standard deviation of 0.2 inch. What is the range of pipe length that should be expected? Is a pipe length of 101 inches plausible? Is a pipe length of 97 inches plausible? What is the probability that a randomly selected pipe will be between 102 inches and 103 inches?

101: No, it's not in the confidence interval
97: No, it's not in the confidence interval



CI = mean \pm 2(standard deviation)

CI = 102.4 + 2(0.2) = 102.8

102.4 - 2(0.2) = 102

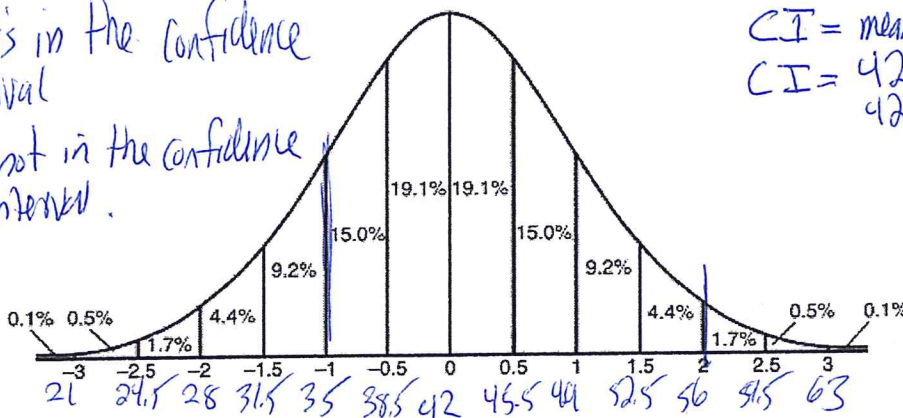
[102, 102.8]

4.4
9.2
15.0
19.1
19.1
15.0
9.2
4.4
1.7
0.5

97.6%

5. The amount of time students practice their instrument is normally distributed with a mean of 42 minutes and a standard deviation of 7 minutes. What is the confidence interval for the amount of time that students practice their instrument? Is a time of 30 minutes plausible? Is a time of 76 minutes plausible? What is the probability that a randomly selected student practice between 35 and 56 minutes?

30: yes, it's in the confidence interval
76: No, it's not in the confidence interval



CI = mean \pm 2(standard deviation)

CI = 42 + 2(7) = 56

42 - 2(7) = 28 [28, 56]

15.0
+19.1
+19.1
+15.0
+9.2
+4.4

81.8%

81.8%