CI Worksheet for One Populations, sigma known

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On this page we will see a number of situations with related questions. In each case, this page will give the answers to those questions. Your task is to find those same answers by inspecting the given information and/or by using a calculator or computer to produce those desired values.

Case 1:

We have a sample of size 40 from a population that we know has a standard deviation of 6.22. The mean of that sample is 73.14.

(1) What is the point estimate for the mean, μ_1, of the population? (**Answer= 73.14**)

(2) Considering the size of our sample, what is the standard deviation of sample means for sample of this size? (**Answer= 0.9835**)

(3) We want a 96% confidence interval. We know that the sample means are normally distributed.What is the **z** value that we will use so that in a standard normal distribution there is 96% of the area between ⁻**z** and **z**? (**Answer= 2.0537** or **-2.0537**)

(4) Using all of those results, what is the 96% confidence interval for the population mean? (**Answer= (71.1202, 75.1598)**)

(5) What is the value of the margin of error for that coonfidence interval? (**Answer= 2.0198**)

Case 2:

We have a sample of size 48 from a population that we know has a standard deviation of 5.85. The mean of that sample is 75.39.

(6) What is the point estimate for the mean, μ_1, of the population? (**Answer= 75.39**)

(7) Considering the size of our sample, what is the standard deviation of sample means for sample of this size? (**Answer= 0.8444**)

(8) We want a 98% confidence interval. We know that the sample means are normally distributed.What is the **z** value that we will use so that in a standard normal distribution there is 98% of the area between ⁻**z** and **z**? (**Answer= 2.3263** or **-2.3263**)

(9) Using all of those results, what is the 98% confidence interval for the population mean? (**Answer= (73.4257, 77.3543)**)

(10) What is the value of the margin of error for that coonfidence interval? **(Answer= 1.9643)**

Case 3:

We have a sample of size 17 from a population that we know to be approximately normally distributed. The population has a standard deviation of 6.22. The mean of the sample is -3.29.

(11) What is the point estimate for the mean, μ_1, of the population? (**Answer= -3.29)**

(12) Considering the size of our sample, what is the standard deviation of sample means for sample of this size? **(Answer= 1.5086)**

(13) We want a 96% confidence interval. We know that the sample means are normally distributed.What is the **z** value that we will use so that in a standard normal distribution there is 96% of the area between ⁻z and **z**? **(Answer= 2.0537** or **-2.0537)**

(14) Using all of those results, what is the 96% confidence interval for the population mean? **(Answer= (-6.3882, -0.1918)**

(15) What is the value of the margin of error for that confidence interval? **(Answer= 3.0982)**

Case 4:

We have a population with a known standard deviation σ_1=4.7. We draw a random sample from that population. Here is that sample:

Table 1: Sample from Population 4.1																			
49.7	47.1	51.5	59.6	53.5	59.4	45.2	47.1	50.2	53.5	45.7	51.2	45.4	40.9	46.2	54.4	53.6	41.5	52.1	52.9
44.5	54.4	52.6	48.7	47.8	46.3	48.3	50.0	48.5	56.5	48.9	42.3	52.1	49.4	46.5	42.9	50.7	49.9	45.2	41.3

You can generate this set of data using the command **gnrnd4(1670693904,4700487).**

(16) What is the sample size of the sample? **(Answer= 40)**

(18) What is the sample mean of the sample? **(Answer= 49.1875)**

(19) What is the point estimate for the population mean? (**Answer=49.1875)**

(20) Considering the size of our sample, what is the standard deviation of sample means for sample of this size? **(Answer= 0.7431)**

(21) We want a 80% confidence interval. We know that the sample means are normally distributed.What is the **z** value that we will use so that in a standard normal distribution there is 80% of the area between ⁻z and **z**? **(Answer= 1.2816** or **-1.2816)**

(22) Using all of those results, what is the 80% confidence interval for the population mean? **(Answer= (48.2351, 50.1399)**

(23) What is the value of the margin of error for that confidence interval? **(Answer= 0.9524)**

Case 5:

We have a population with a known standard deviation σ_1=8.5. We draw a random sample from that population. Here is that sample:

Table 1: Sample from Population 4.1																	
-59.2	-56.0	-48.1	-66.7	-74.3	-74.0	-48.3	-40.8	-62.2	-50.1	-81.1	-62.9	-66.9	-59.4	-62.8	-69.5	-62.0	-50.7
-56.3	-56.8	-85.4	-72.4	-66.0	-65.4	-50.9	-64.0	-63.4	-57.6	-73.6	-76.6	-48.6	-67.0	-54.5	-65.8	-69.5	-68.7
-71.6	-64.0	-56.1	-64.7	-44.5	-76.7	-61.3	-63.6	-78.3	-71.8	-57.7	-64.2	-59.8	-83.7	-60.8	-80.2	-54.4	-73.8
-60.8	-72.9	-70.5	-74.1	-67.6	-57.4	-57.4	-59.1	-74.6	-53.3	-70.0	-61.9						

You can generate this set of data using the command **gnrnd4(6232646504,8500629).**

(24) What is the sample size of the sample? **(Answer= 66)**

(26) What is the sample mean of the sample? **(Answer= -64.0045)**

(27) What is the point estimate for the population mean? (**Answer=-64.0045)**

(28) Considering the size of our sample, what is the standard deviation of sample means for sample of this size? **(Answer= 1.0463)**

(29) We want a 92% confidence interval. We know that the sample means are normally distributed.What is the **z** value that we will use so that in a standard normal distribution there is 92% of the area between $^-$**z** and **z**? **(Answer= 1.7507 or -1.7507)**

(30) Using all of those results, what is the 92% confidence interval for the population mean? **(Answer= (-65.8362, -62.1728)**

(31) What is the value of the margin of error for that confidence interval? **(Answer= 1.8317)**

Case 6:

We have a population with a known standard deviation σ_1=6.9. We also know that the population is has an approimate normal distribution. We draw a random sample from that population. Here is that sample:

Table 1: Sample from Population 4.1																	
5.9	6.3	4.3	0.8	19.5	7.8	6.0	3.9	2.4	0.1	8.5	-3.5	-8.5	3.3	-11.4	0.5	6.4	8.1
-5.6	1.6	9.5	11.5	7.4	-3.5	-2.5	0.7										

You can generate this set of data using the command **gnrnd4(1695512504,6900026).**

(32) What is the sample size of the sample? **(Answer= 26)**

(34) What is the sample mean of the sample? **(Answer= 3.0577)**

(35) What is the point estimate for the population mean? (**Answer=3.0577)**

(36) Considering the size of our sample, what is the standard deviation of sample means for sample of this size? **(Answer= 1.3532)**

(37) We want a 88% confidence interval. We know that the sample means are normally distributed.What is the **z** value that we will use so that in a standard normal distribution there is 88% of the area between ⁻**z** and **z**? **(Answer= 1.5548** or **-1.5548)**

(38) Using all of those results, what is the 88% confidence interval for the population mean? **(Answer= (0.9538, 5.1616)**

(39) What is the value of the margin of error for that confidence interval? **(Answer= 2.1039)**

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