PRINTABLE VERSION

Quiz 9

You scored 100 out of 100

Question 1

Your answer is CORRECT.

As the length of the confidence interval for the population mean increases, the degree of confidence in the interval's actually containing the population mean

a) decreases

b) increases

c) does not change

Question 2

Your answer is CORRECT.

The gas mileage for a certain model of car is known to have a standard deviation of 4 mi/gallon. A simple random sample of 100 cars of this model is chosen and found to have a mean gas mileage of 28.4 mi/gallon. Construct a 98% confidence interval for the mean gas mileage for this car model.

$\sigma = 4 \quad n = 100 \quad \bar{x} = 28.4 \quad C = 98\%$

$z^* = |qnorm(1.98/2)| = qnorm\left(\frac{1+C}{2}\right)$

$\bar{x} \pm z^* \cdot \frac{\sigma}{\sqrt{n}}$

$28.4 \pm c(-1,1) * qnorm\left(\frac{1.98}{2}\right) * \frac{4}{\sqrt{100}}$

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28.4 + c(-1,1)* qnorm(1.98/2)*4/sqrt(100)
[1] 27.46946 29.33054
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a) (27.578, 29.222)

b) (27.470, 29.330)

c) (19.096, 37.704)

d) (20.184, 36.616)

e) (28.307, 28.493)

f) None of the above

Question 3

Your answer is CORRECT.

What will increase the width of a confidence interval?

CI

$\bar{x} \pm z^* \frac{\sigma}{\sqrt{n}}$

a) Increase number in sample

b) Decrease confidence level.

c) Decrease variance

d) Increase variance.

Question 4

Your answer is CORRECT.

If the 90% confidence limits for the population mean are 33 and 47, which of the following *could be* the 98% confidence limits

a) (30, 50) ↑ 90% → 98% CI increase

b) (36, 41)

c) (38, 42)

d) (38, 45)

e) (39, 43)

f) None of the above

Question 5

Your answer is CORRECT.

A 98% confidence interval for the mean of a population is to be constructed and must be accurate to within 0.3 unit. A preliminary sample standard deviation is 1.2. The smallest sample size n that provides the desired accuracy is

$C = 0.98 \quad ME = 0.3 \quad s = 1.2$

$$n = \left(z^* * \frac{s}{ME}\right)^2 = \left(qnorm\left(\frac{1.98}{2}\right) * \frac{1.2}{0.3}\right)^2 = 86.5 = 87$$

a) 90

b) 87

c) 76

d) 96

e) 97

f) None of the above

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(qnorm(1.98/2,)*1.2/0.3)^2
[1] 86.59031
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Question 6

Your answer is CORRECT.

An SRS of 21 students at UH gave an average height of 5.5 feet and a standard deviation of .1 feet. Construct a 90% confidence interval for the mean height of students at UH.

$n = 21 \quad \bar{x} = 5.5 \quad s = 0.1 \quad C = 0.9$

$$\bar{x} \pm t^* * \frac{s}{\sqrt{n}} = 5.5 \pm qt\left(\frac{1.9}{2}, 20\right) * \frac{0.1}{\sqrt{21}}$$

a) (5.462, 5.538)

b) (4.250, 6.950)

c) (5.328, 5.672)

5.5 + c(-1,1) * qt(1.9/2,20) * 0.1 /sqrt(21)
[1] 5.462364 5.537636

d) (5.492, 5.508)

e) (4.000, 7.300)

f) None of the above

Question 7

Your answer is CORRECT.

Which test statistic should be used when computing a confidence interval given only the number in a sample, the sample mean and sample standard deviation?

a) z

b) t

c) p

d) q

Question 8

Your answer is CORRECT.

An important problem in industry is shipment damage. A electronics distribution company ships its product by truck and determines that it can meet its profit expectations if, on average, the number of damaged items per truckload is fewer than 12. A random sample of 12 departing truckloads is selected at the delivery point and the average number of damaged items per truckload is calculated to be 11.3 with a calculated sample of variance of 0.49. Select a 95% confidence interval for the true mean of damaged items.

a) (10.86, 11.74)

$n = 12 \quad \bar{x} = 11.3 \quad s^2 = 0.49 \quad s = 0.7 \quad c = 0.95$

$\bar{x} \pm t^* \frac{s}{\sqrt{n}} = 11.3 \pm qt\left(\frac{1.95}{2}, 11\right) * \frac{0.7}{\sqrt{12}}$

b) (11.56, 12.44)

c) (-0.4446, 0.4446)

d) (10.69, 11.91)

e) [48.92, -29.36]

11.3 + c(-1,1) * qt(1.95/2, 11)* 0.7/sqrt(12)
[1] 10.85524 11.74476

f) None of the above

Question 9

Your answer is CORRECT.

The amounts (in ounces) of juice in eight randomly selected juice bottles are:
15.8, 15.6, 15.1, 15.2, 15.1, 15.5, 15.9, 15.5

Construct a 89% confidence interval for the mean amount of juice in all such bottles. Assume an approximate Normal distribution.

$c = 0.89 \quad n = 8 \quad \bar{x} = 15.4625 \quad s = 0.3068$

$\bar{x} \pm t^* * \frac{s}{\sqrt{n}} = 15.4625 \pm qt\left(\frac{1.89}{2}, 7\right) * \frac{0.3068}{\sqrt{8}}$

a) (15.329, 15.596)

b) (15.264, 15.661)

c) (15.316, 15.609)

d) (15.289, 15.636)

e) None of the above

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15.4625 + c(-1,1)*qt(1.89/2,7)*0.3068/sqrt(8)
[1] 15.26404 15.66096
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Question 10

Your answer is CORRECT.

Among 20 golden hamster litters recorded, there was a sample mean of $\bar{x} = 7.72$ baby hamsters, with a sample standard deviation of $s = 2.5$ hamsters per liter. Create a 97.8% confidence interval for the mean number of baby hamsters per liter.

$n = 20 \quad \bar{x} = 7.72 \quad s = 2.5 \quad c = 0.978$

$\bar{x} \pm t^* * \frac{s}{\sqrt{n}}$

a) 7.72 ± 1.2060

b) 7.72 ± 1.3944

c) 7.72 ± 2.50

d) 7.72 ± 1.2804

e) 7.72 ± 0.5590

f) None of the above

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qt(1.978/2,19) * 2.5/ sqrt(20)
[1] 1.394394
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Question 11

Your answer is CORRECT.

Which of the following is not appropriate to use the t-confidence interval for μ.

σ is unknown

a) The variable has a Normal distribution.

b) The population standard deviation, σ, is known.

c) The sample size is greater than 30.

d) The sample is based on a simple random sample (SRS).

e) All of the above are appropriate.

Question 12

Your answer is CORRECT.

A 95% confidence interval for a population parameter means that if a large number of confidence intervals were constructed from repeated samples, then on average, 95% of these intervals would contain the true parameter.

a) True

b) False

Question 13

Your answer is CORRECT.

Suppose you were told that a 95% confidence interval for the population mean of mpg of a hybrid car was (22, 30). Determine the point estimate for this population mean.

a) 22

b) 30

$\frac{22+30}{2} = 26$

c) 1.96

d) 95

e) 26

f) None of the above.

Question 14

Your answer is CORRECT.

Which of the following statements are true?

a) The sample mean is an unbiased estimate of the population mean.

b) The z-critical value is an estimate of the population mean.

c) The t-critical value is an estimate of the population standard deviation.

d) The sample standard deviation is an unbiased estimate of the population standard deviation.

e) None of the above.