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Problem 1

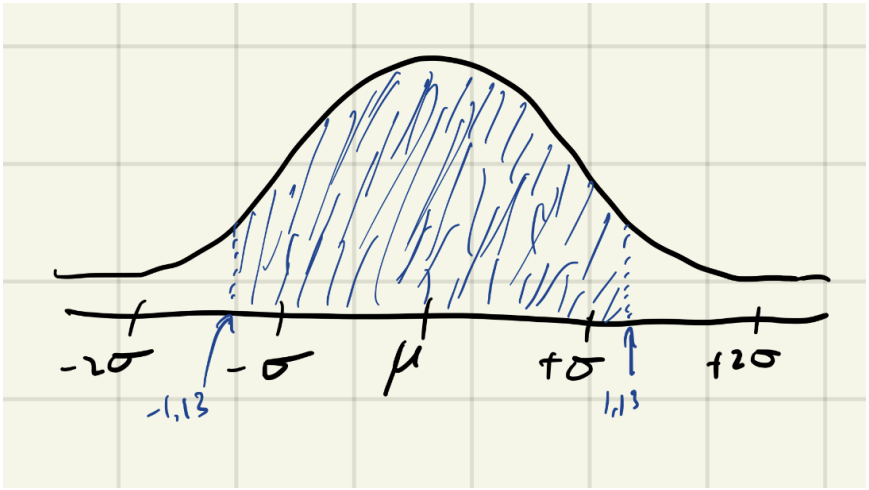
Given:

$$\bar{x} - 1.13\sigma/\sqrt{n} \leq \mu \leq \bar{x} + 1.13\sigma/\sqrt{n}$$

Find:

Confidence level

Diagram:



Theory:

Percent area under normal curve given the z score range

Assumptions:

Normal distribution

Solution:

Used ti 84 calculator

Normalcdf(-1.13, 1.13, 0, 1) = 0.7415 or 74.15% confident

Problem 2

Given:

n = 91, average = 216, 95% confidence interval: (210, 222)

Find:

- Population standard deviation

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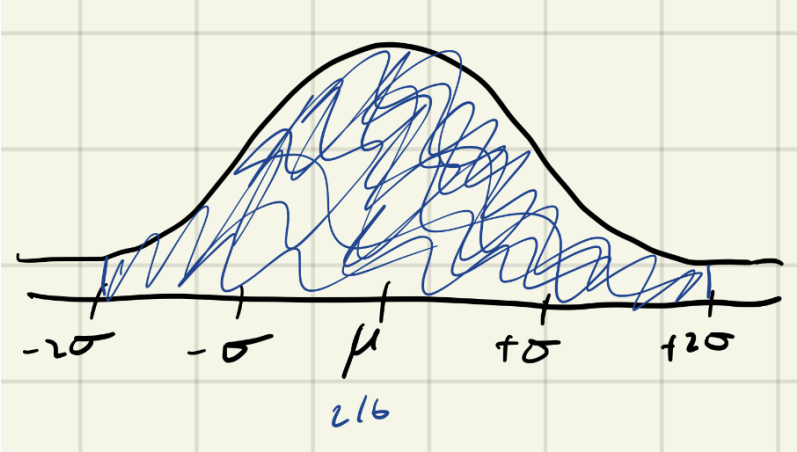
- confidence interval if n is doubled

Diagram:



Theory:

$$CI = \bar{x} \pm z\frac{s}{\sqrt{n}}$$

Assumptions:

Stats follow normal curve

Solution:

used old school tables

Error = 6 = $z\frac{s}{\sqrt{n}}$, z=1.96, n = 91 so s = 29.2 discord messages per day

New CI: 1.96 * 29.2 / sqrt(91*2) = 216 +/- 4.24 discord messages per day

Problem 3

Given:

Error = 2 days when n = 102 for a 90% confidence interval

Find:

The number of records that are needed to find a 90% confidence interval with an error of +/- 1 day

Diagram:

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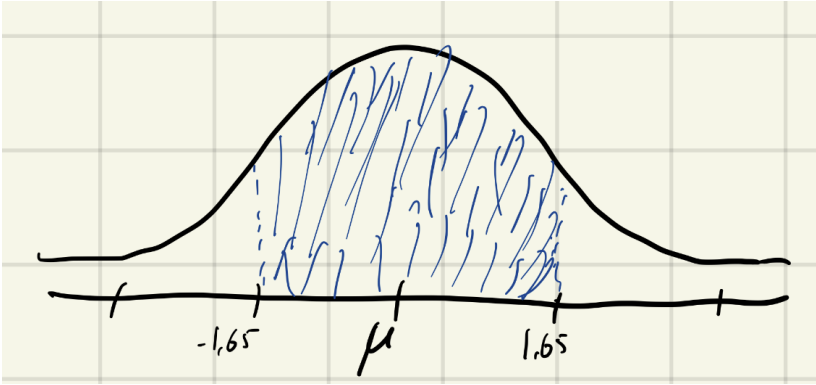

Theory:

$$CI = \bar{x} \pm z\frac{s}{\sqrt{n}}$$

Assumptions:

Stats follow normal distribution

Visitors are under 35 years of age

Solution:

Used old school tables

Z = 1.65 since confidence level is 90%

Standard deviation = 2 * sqrt(n) / z = 12.2

Error = 1 = z * s / sqrt(n); n = (1.65*12.22)^2 = **408 records**