Example 8.2
Confidence Interval Estimates

OpenStax

Introductory Statistics 2e

Example

Suppose scores on exams in statistics are normally distributed with an unknown population mean and a population standard deviation of three points. A random sample of 36 scores is taken and gives a sample mean of 68. Find a confidence interval estimate for the population mean exam score.

$$\bar{X} - z_\alpha\left(\frac{\sigma}{\sqrt{n}}\right) \leq \mu \leq \bar{X} + z_\alpha\left(\frac{\sigma}{\sqrt{n}}\right)$$

$\bar{X} = 68$, $\sigma = 3$, $n = 36$, $z_{0.05}$ from calculator

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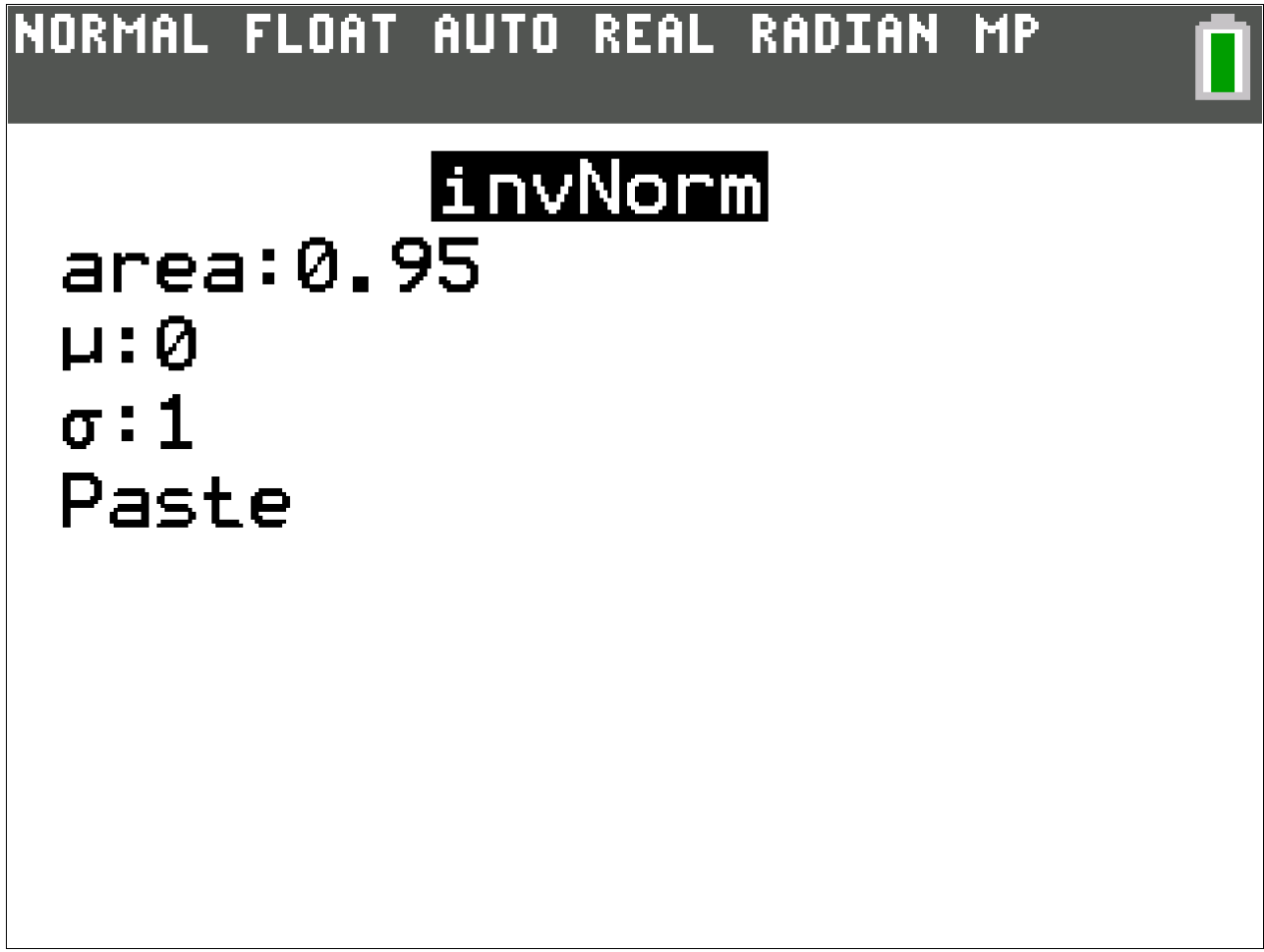

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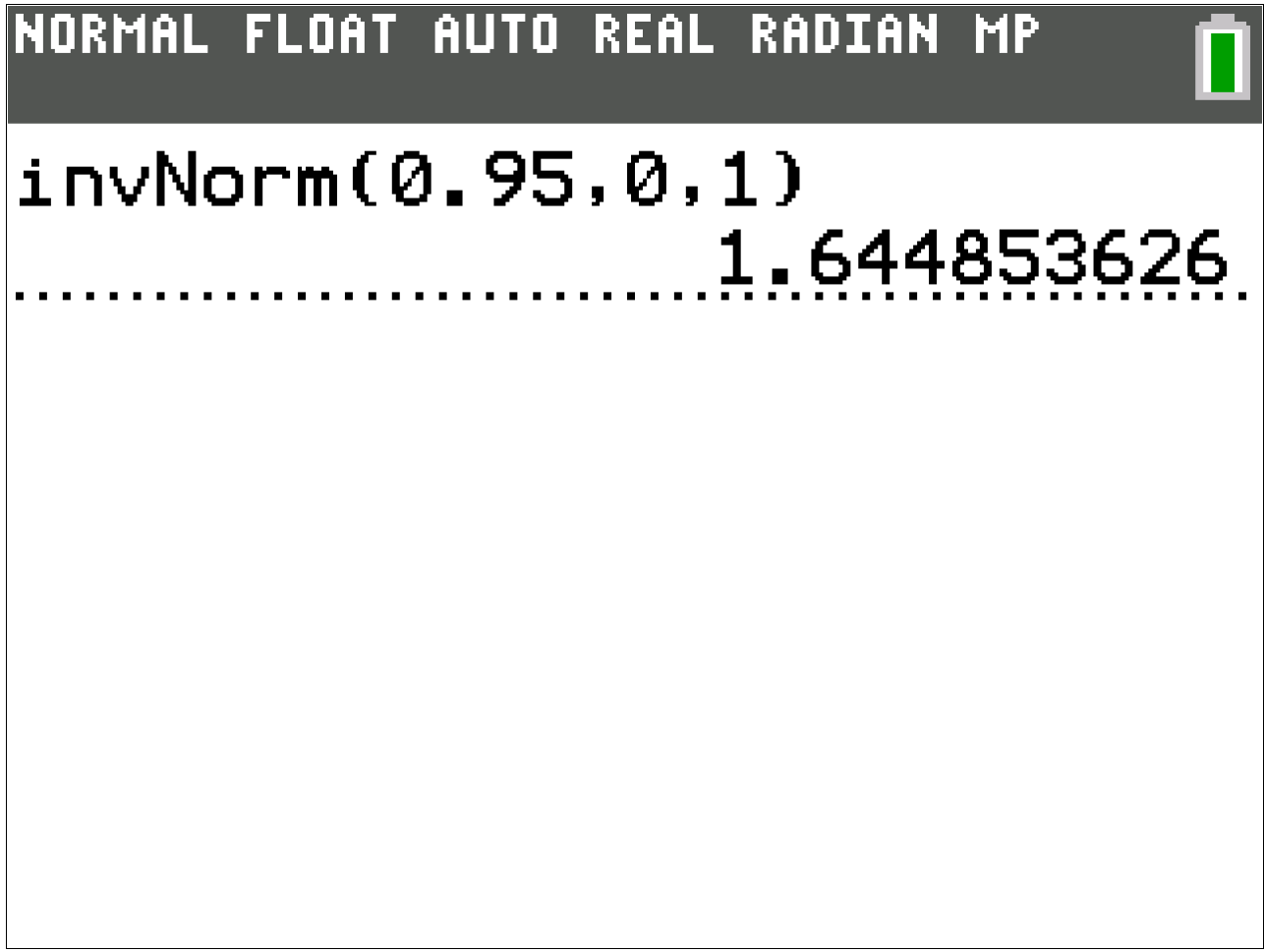

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$\bar{X} = 68$, $\sigma = 3$, $n = 36$, $z_{0.05}$ from calculator

$$68 - 1.645\left(\frac{3}{\sqrt{36}}\right) \leq \mu \leq 68 + 1.645\left(\frac{3}{\sqrt{36}}\right)$$

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$$67.178 \le \mu \le 68.822$$

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