List of Formulas, Procedures and Boxes for Quiz 4, April 28

(Quiz 4 will be on Monday, April 28, and covers material from Chapter 20.2.)

Math 125 *Kovitz* Spring 2025

From Text

Both boxes on page 360.

Summary on page 373: point 5.

Formulas

The Standard Error for a Sample Percentage

$$\textbf{SE for percentage} = \left(\textbf{SD of box}/\sqrt{\textbf{number of draws}}\right) \times \textbf{100}\%.$$

It is a fact that the SD of a 0–1 counting box is always .5 or less. This means that the SE for a percentage is always less than $\dfrac{50\%}{\sqrt{\text{number of draws}}}$, no matter what the percentage of the box.

Warning: if the problem involves classifying and counting to get a percent, put 0's and 1's in the box.

Summarizing

$$\begin{aligned} \text{SE for count} &= \text{SE for sum, from a 0–1 box} \\ \text{SE for percent} &= \frac{\text{SE for count}}{\text{number of draws}} \times 100\% = \frac{\text{SD of zero-one box}}{\sqrt{\text{number of draws}}} \times 100\% \end{aligned}$$

The Standard Error for a Percentage as the Sample Size Changes:

Multiplying the size of a sample by some factor divides the SE for a percentage not by the whole factor—but by its square root.

The preferred formula is: $\text{SE for percentage} = \dfrac{\text{SD of box}}{\sqrt{\text{number of draws}}} \times 100\%$.

For example: A fair coin is tossed 625 times. Find the standard error for the percentage of heads.

The SE for the percentage of heads just equals the SD of the couning box divided by the the square root of the number of draws multiplied by 100%, or $(0.5/\sqrt{625}) \times 100\% = 50\%/25 = 2\%$.