Solution to Practice for Quiz 4

Math 125 (Introductory Statistics) *Kovitz* Spring 2025

WARNING This problem is one of the rare algebra problems in the course.

The chance error for the percent is (SD of box)/$\sqrt{\text{no. of draws}}$ $\times$ 100%.

The SD of a 0–1 box cannot exceed 0.50, so use the worst case in the calculation.

$0.25\% = 0.50/\sqrt{n} \times 100\%$.

$0.25\% = 50\%/\sqrt{n}$. (Multiply 0.50 times 100%.)

$\sqrt{n}$ times $0.25\% = 50\%$. (Multiply both sides by $\sqrt{n}$.)

$\sqrt{n} = 50\%/0.25\% = 200$. (Divide both sides by 0.25%; then divide 50% by 0.25%.)

Now square both sides. $n = 200^2 = 40,000$. Answer: (D) 40,000

Or, just write the formula for the standard error of a percent and plug in each of the five proposed values of n.

$$\frac{\text{SD}_{\times 100\%}}{\sqrt{n}}.$$

By the time you get to 40,000, the result will be

$$\frac{0.50\times 100\%}{\sqrt{40{,}000}} = \frac{50\%}{200} = 1/4 \text{ of } 1\ \%, \text{ the desired result.}$$