S.IC.B.4: Analysis of Data

1   Betty conducted a survey of her class to see if they like pizza. She gathered 200 responses and 65% of the voters
    said they did like pizza. Betty then ran a simulation of 400 more surveys, each with 200 responses, assuming that
    65% of the voters would like pizza. The output of the simulation is shown below.

Samples = 400
Mean = 0.654
SD = 0.035

Considering the middle 95% of the data, what is the margin of error for the simulation?
1)   0.01   3)   0.05
2)   0.02   4)   0.07

2   A candidate for political office commissioned a poll. His staff received responses from 900 likely voters and 55%
    of them said they would vote for the candidate. The staff then conducted a simulation of 1000 more polls of 900
    voters, assuming that 55% of voters would vote for their candidate. The output of the simulation is shown in the
    diagram below.

Given this output, and assuming a 95% confidence level, the margin of error for the poll is closest to
1)   0.01   3)   0.06
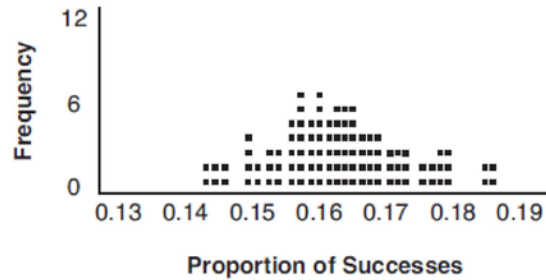2)   0.03   4)   0.12

3 A study conducted in 2004 in New York City found that 212 out of 1334 participants had hypertension. Kim ran a simulation of 100 studies based on these data. The output of the simulation is shown in the diagram below.

At a 95% confidence level, the proportion of New York City residents with hypertension and the margin of error are closest to
1) proportion $\approx .16$; margin of error $\approx .01$
2) proportion $\approx .16$; margin of error $\approx .02$
3) proportion $\approx .01$; margin of error $\approx .16$
4) proportion $\approx .02$; margin of error $\approx .16$

4 Marissa and Sydney are trying to determine if there is enough interest in their school to put on a senior musical. They randomly surveyed 100 members of the senior class and 43% of them said they would be interested in being in a senior musical. Marissa and Sydney then conducted a simulation of 500 more surveys, each of 100 seniors, assuming that 43% of the senior class would be interested in being in the musical. The output of the simulation is shown below.
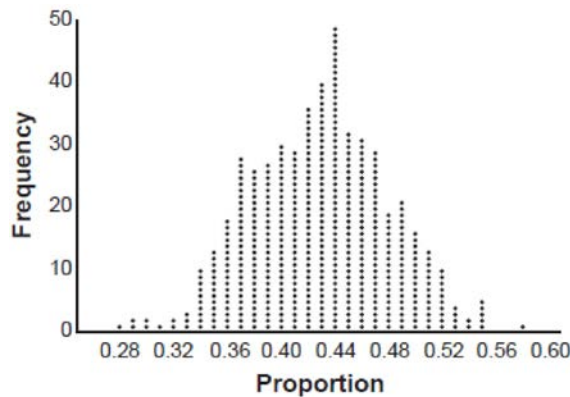
The standard deviation of the simulation is closest to
1) 0.02
2) 0.05
3) 0.09
4) 0.43

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Answer Section

1 ANS: 4
$2 \times 0.035 = 0.07$

REF: 012319aii

2 ANS: 2

$$ME = \left(z\sqrt{\frac{p(1-p)}{n}} \right) = \left(1.96\sqrt{\frac{(0.55)(0.45)}{900}} \right) \approx 0.03 \text{ or } \frac{1}{\sqrt{900}} \approx 0.03$$

REF: 081612aii

3 ANS: 2

$$\frac{212}{1334} \approx .16 \quad ME = \left(z\sqrt{\frac{p(1-p)}{n}} \right) = \left(1.96\sqrt{\frac{(0.16)(0.84)}{1334}} \right) \approx 0.02 \text{ or } \frac{1}{\sqrt{1334}} \approx .027$$

REF: 081716aii

4 ANS: 2

$$ME = \left(z\sqrt{\frac{p(1-p)}{n}} \right) = \left(1.96\sqrt{\frac{(0.43)(0.57)}{100}} \right) \approx 0.097 \quad \frac{0.097}{2} \approx 0.05 \text{ or } \frac{1}{\sqrt{100}} \approx 0.1 \quad \frac{0.1}{2} = 0.05$$

REF: 062317aii