There are questions on both sides.

1. Gasoline prices reached record high levels in 16 states during 2003. Two of the affected states were California and Florida. The American Automobile Association reported a sample mean price of $2.06 per gallon in California and sample mean price of $1.78 per gallon in Florida. Use a sample size of 45 for the California data and a sample size of 42 for the Florida data. Assume that prior studies indicate a population standard deviation of .12 in California and .09 in Florida are reasonable.

\[ \bar{X}_1 = 2.06, \quad n_1 = 45, \quad \sigma_1 = .12 \]

\[ \bar{X}_2 = 1.78, \quad n_2 = 42, \quad \sigma_2 = .09 \]

a. What is the point estimate of the difference between the population mean prices per gallon in California and Florida?

\[ \bar{X}_1 - \bar{X}_2 = 2.06 - 1.78 = .28 \]

b. At 95% confidence, what is the margin of error?

\[ ME = .28 - .23561 = .04439 \]

By hand:

\[ Z_{.025} = 1.96 \, \sqrt{\frac{.12^2}{45} + \frac{.09^2}{42}} \approx .04441 \]

By calculator:

By calculator: 2 Sample Z-interval with values as indicated above

\[ (.23561, .32439) \]

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2. The Professional Golf Association (PGA) measured the putting accuracy of professional golfers playing on the PGA Tour and the best amateur golfers playing in the World Amateur Championship. A sample of 1075 6 foot putts by professional golfers found 685 made putts. A sample of 1200 6-foot putts by amateur golfers found 705 made putts.

\[ n_1 = 1075 \]
\[ X_1 = 685 \]
\[ n_2 = 1200 \]
\[ X_2 = 705 \]

a. What is the point estimate of the difference between the proportions of the two populations?

\[
\hat{p}_1 - \hat{p}_2 = \frac{685}{1075} - \frac{705}{1200} = 0.6372 - 0.5875 = 0.0497
\]

b. What is the 99% confidence interval for the difference between the two population proportions?

**By Hand:**

\[
\text{ME} = 2.576 \sqrt{\frac{0.6372(1-0.6372)}{1075} + \frac{0.5875(1-0.5875)}{1200}}
\]

\[ = 0.0526 \]

\[ CI = 0.0497 \pm 0.0526 \]

\[ (-0.0029, 0.1023) \]

**By Calculator:**

2 Proportion Z-Interval using values as indicated above.

\[ (-0.0029, 0.1023) \]

c. Interpret this confidence interval within the context of this scenario.

Because 0 is contained in the 99% confidence interval, we do not have enough evidence to conclude that the professional golfers are more accurate putters than the amateurs.