

Section 3: CLT & Sampling Distributions

Quiz:

There are two candidates running for governor in CA and they are said to have roughly equal support from the voters. To get a better idea who is ahead, a company polls 400 of the 20 million registered voters in California. Likewise, there are two candidates running for mayor in Palo Alto who are said to have roughly equal support, and the company polls 400 out of 20,000 registered voters in Palo Alto. Will the first poll be more/equal/less accurate than the second?

- a) More accurate
- b) Less accurate
- c) Equally accurate

Answer: C, equation for standard error only depends on \sqrt{n} in denominator

At the beginning of the term, the amount of time a student waits in line at the campus store is normally distributed with a mean of five minutes and a standard deviation of two minutes.

What is the median waiting time for one student?

- a) 2
- b) 5
- c) $5/\sqrt{2}$
- d) cannot be determined

ANSWER: b) 5

EXPLANATION: For a normal distribution, the median is the same as the mean, which is 5.

Suppose that the time that owners keep their cars (purchased new) is normally distributed with a mean of seven years and a standard deviation of two years. We are interested in how long an individual keeps his car (purchased new). Our population is people who buy their cars new. If we are to pick individuals ten at a time, find the distribution for the mean car length ownership.

- a) $N(7, 0.63)$
- b) $N(7, 2)$
- c) $N(7, 0.45)$
- d) $U(7,2)$

ANSWER: a) $N(7, 0.63)$

EXPLANATION: The sampling distribution of the mean follows a normal distribution in which the mean is the same as the mean of X (in this case, 7) and the standard deviation is that of X divided by the square root of the sample size (in this case, $2/\sqrt{10} = 0.63$).

