CONFIDENCE INTERVALS
(ASSUMING THE POPULATION STANDARD DEVIATION σ
OF THE RANDOM VARIABLE X IS KNOWN)

We start with:

- A fixed sample size n
- A confidence level C (e.g., 99%, 95%, 90%)

Picture:

Find (from tables or software) the value z* so that the percent of the area under the standard normal curve that is between –z* and z* is C.

If X is N(μ,σ), then we know that the (sampling) distribution of sample means $\bar{x}$ of SRS's of size n is ____________________.

Standardizing $\bar{x}$, we know that ___________________ has a standard normal distribution.

So for percentage C of SRS's of size n, ________________ is between –z* and z*.

Therefore, for percentage C of SRS's of size n, $\bar{x}$ - μ is between __________ and _________.

Consequently, for percentage C of SRS's of size n, μ is within distance _______ of $\bar{x}$.

So our confidence interval for μ is (,   ).

The margin of error is ______________.

If X is not normal but n is large enough and X is close enough to normal that the sampling distribution of the sample means $\bar{x}$ of SRS's of size n is approximately normal, then we can proceed as above to obtain an *approximate* level C confidence interval.