Section 7.6 Confidence Intervals for a Population Mean (μ) (σ is unknown).

1. Gather $\bar{x}$, s = sample std. dev., n, level of conf. Verify $n > 30$ or pop. is normal.
2. $\alpha = 1 - (\text{level of confidence})$
3. Look up $t_{\alpha/2}$ on Table A2.

   df → $n-1$ → $t_{\alpha/2}$

   α 2-tail →
4. $E = t_{\alpha/2} \cdot \frac{s}{\sqrt{n}}$ ← max. error
5. Conf. Interval: $\bar{x} - E < \mu < \bar{x} + E$.

The mean hours of sleep for 35 (random) Mt. SAC students was 3.4 hours a night, with a std. dev of 1.6 hours. Construct a 96% confidence interval for the mean hours of sleep of all Mt SAC students.

1. $\bar{x} = 3.4$, $s = 1.6$, $n = 35 > 30$ ✓, Conf $= 0.96$
2. $\alpha = 1 - \text{conf} = 1 - 0.96 = 0.04$
3. Table A2

   df → $n-1 = 34$

   $\alpha = .04$ 2-tail → 2.136

4. $E = t_{\alpha/2} \cdot \frac{s}{\sqrt{n}} = 2.136 \cdot \frac{1.6}{\sqrt{35}} \approx 0.58$
5. $\bar{x} - E < \mu < \bar{x} + E$

   $3.4 - 0.58 < \mu < 3.4 + 0.58$

   $2.82 < \mu < 3.98$.