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1. Find the critical value z_c that corresponds to an 88% confidence level.

Find the critical value, t_c , for c = 0.90 and n = 22. 2.

Find the margin of error for the given information: 3.

a.
$$c = 0.90$$
, $\sigma = 5.8$, $n = 52$ (one decimal place) $\frac{1-.9}{7} = \frac{1}{2} = .0500$ $\frac{1}{2} = \frac{1}{2} = .0500$

b. c = 0.95, s = 3.6, n = 45 (one decimal place) t = 2, 02

c. c = 0.90, $\hat{p} = 0.36$, n = 40 (three decimal places) $\frac{1}{2}$

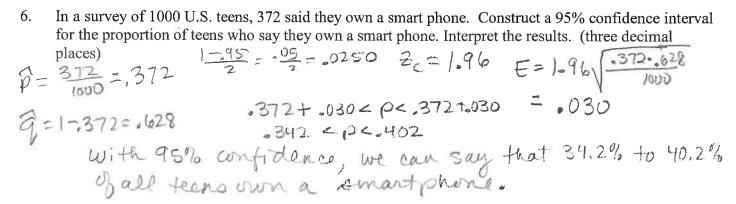
$$6.64$$
 6.645 $\frac{36.64}{40} = 125$

4. Use the given confidence interval to find the sample mean and the margin of error: (42.8, 57.6).

$$X = \frac{42.8+67.6}{2} = 50.2$$

- X = 50.2 E = 7.4
- We start with a simple random sample of 25 of a particular species of newts and measure their tails. The mean tail length of our sample is 5 cm. Assume the tail lengths are normally distributed.
 - If we know that 0.2 cm is the standard deviation of the tail lengths of all newts in the population, then what is a 90% confidence interval for the mean tail length of all newts in the population? (one decimal place)

- X=5 Zc=1.645 With 90% confidence, we can say that
 the most tail length of all Newts is between
 the standard deviation of the tail lengths of the newts in our sample
 - If we find that that 0.2 cm is the standard deviation of the tail lengths of the newts in our sample population, then what is a 90% confidence interval for the mean tail length of all newts in the population? (one decimal place)



- 7. A researcher at a major hospital wishes to estimate the proportion of the adult population of the U.S. that has high blood pressure.
- a. How large a sample is needed in order to be 99% confident that the sample proportion will not differ from the true proportion by more than 8%? == .08

$$n = .5.5 \left(\frac{2.575}{.08}\right)^2 = 259.0.$$
 $n = 260$

b. What if a previous study indicates that the proportion of U.S. adults with high blood pressure is 23%? What is the minimum sample size now?

\(\begin{align*}
\text{ = .2 3 } \\ \frac{2}{5} = .7 7 \\ \text{ = .2.575 } \text{ = .02} \end{align*}

$$n = .23 \cdot .77 \left(\frac{2.575}{.08}\right)^2 = 183.4...$$
 $n = 184)$

8. The standard IQ test has a mean of 97 and a population standard deviation of 18. We want to be 90% certain that we are within 5 IQ points of the true mean. What is the minimum sample size required?

$$X=97$$
 $\sigma = 18$ $c=.90$ $z=1.645$ $E=5$

$$N = \left(\frac{1.645 \cdot 18}{5}\right)^2 = 35.07...$$
 $N = 36$

9. In a random sample of 12 senior-level chemical engineers, the mean annual earnings was \$133,326 and the standard deviation was \$36,729. Assume the annual earnings are normally distributed and construct a 95% confidence interval for the population mean annual earnings for senior-level chemical engineers. Interpret the results. (nearest dollar)

$$N=12$$
 $\bar{\chi}=133,326$ $S=36,729$ $C=.95$ $t_c=2.201$ $E=2.201 \cdot \frac{36729}{\sqrt{12}} = \frac{1}{2}3,337 \rightarrow 133326-23337 < M < 13326+23357 $109989 < M < 156663$$

with 95% (unfidence, we can say the purp mean annual earnings for all sonior-level chemical engineers is between \$109989 to \$156663.