Math 373 Hw 13 Name _____ Score _____/ 21

Hw 282: 8.3′, 8.5′, 8.7′, 8.9′, 8.12, 8.16. Rec 282: 8.3, 8.5, 8.7, 8.9, 8.11, 8.17.

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Recall: the *margin of error* for estimating a parameter using a sample statistic as the estimator is 1.96×SE where SE is the sampling distribution std. dev. of the estimator w.r.t. the sampling distribution (not the std. dev. s or σ of points in the sample).

8.3′. Given the sample size n and variance σ^2, find the margin of error for estimating the population mean μ.
Please note: you are given the variance rather than the std. dev.

(a) $n=25, \sigma^2=.2$ margin of error = ._ _ 9

(b) $n=25, \sigma^2=.9$ margin of error = ._ _ 10

(c) $n=25, \sigma^2=1.5$ margin of error = ._ _ 12

8.5′. Given the sample size n and sample variance s^2, find the margin of error for estimating the population mean μ. Use the sample mean s as an estimate for σ.

(a) $n=30, s^2=4$ margin of error = ._ _ 9

(b) $n=300, s^2=4$ margin of error = ._ _ 5

(c) $n=3000, s^2=4$ margin of error = ._ _ 7

8.7′. Assume the population proportion of success p is unknown but is known to be between .3 and .7. Then $\sqrt{pq} \approx \sqrt{(.5)(.5)}$ and so we can use $p=.5$ instead of the real but unknown proportion p in the SE formula $\sqrt{\frac{pq}{n}}$. Given the sample size n, find the margin of error for estimating a binomial proportion p using the sample proportion $\hat{p}$ as an estimator.

(a) $n=50$ margin of error = ._ _ 5

(b) $n=500$ margin of error = ._ _ 4

(c) $n=5000$ margin of error = ._ _ 1

8.9′. Given the sample size $n=100$ and sample proportion $\hat{p}$, find the margin of error for estimating a binomial proportion p and find the 95% confidence interval. This time use the estimator $\hat{p}$ instead of $p=.5$ in the SE formula $\sqrt{\frac{pq}{n}}$.

(a) $\hat{p}=.1$ margin of error = ._ _ 6

95% confid. int. = ± = [,] 4,7

(b) $\hat{p}=.5$ margin of error = ._ _ 1

95% confid. int. = ± = [,] 4,6

(d) $\hat{p}=.9$ margin of error = ._ _ 6

95% confid. int. = ± = [,] 12,15

8.12. A random sample of $n=50$ observations from a quantitative population produced $\bar{x}=56.4$ and $s^2=2.6$. Give the best point estimate for the population mean μ, and calculate the margin of error and the 95% confidence interval.

μ = _ _ . _ 15

margin of error = ._ _ 9

95% confid. int. = ± = [,] 24,24

8.16. There were 40 men in a random sample of 250 elementary school teachers. Estimate the proportion of male elementary school teachers in the entire population of elementary school teachers. Find the margin of error for this estimate and the 95% confidence interval.

p = ._ _ 7

margin of error = ._ _ 5

95% confid. int. = ± = [,] 2,3