(1) $\mu = 950 \quad \sigma = 200$

(a) $P(x < 700) =$ normalcdf(-1E99, 700, 950, 200)

$\approx \boxed{0.106}$

(b) $P(\bar{x} > 1000) =$ normalcdf(1000, 1E99, 950, $200/\sqrt{50}$)

$\approx \boxed{0.039}$

(c) $X =$ invNorm(.95, 950, 200)

$\approx \boxed{1279}$

(d) 80,000 * normalcdf(-1E99, 700, 950, 200)

$\approx \boxed{8,452}$

(2) $H_0: p = 0.50$

claim → $H_1: p < 0.50$

$\alpha = 0.05$ (OUR CHOICE)

✓ Claim
✓ DATA
✓ α
✓ TS
✓ CV, PV
✓ CON

SAMPLE DATA

$n = 337$

$x = 131$

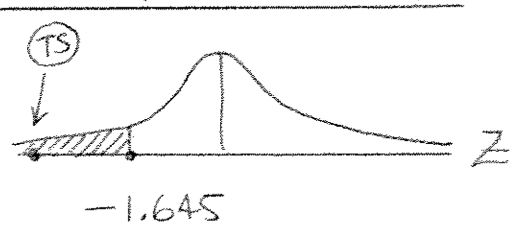
$\hat{p} = 131/337 \approx 0.389$

TEST STATISTIC

$$Z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}} \qquad Z = \frac{.389 - .50}{\sqrt{\frac{(.5)(.5)}{337}}} \approx \boxed{-4.086}$$

P-Value $\approx$ 2.2E-5 $\approx$ $\boxed{0.000022}$

CRITICAL VALUE



$\boxed{\text{REJECT } H_0}$

There is sufficient evidence to support the claim that fewer than 50% of the residents of Los Angeles County were protected by earthquake insurance.

(3) ENTER DATA into L1.

(a) $\bar{x} - E < \mu < \bar{x} + E$

$E = t_{\frac{\alpha}{2}} \cdot \frac{s}{\sqrt{n}}$

$1.47 - E < \mu < 1.47 + E$

$E = (3.499) \cdot \frac{0.064}{\sqrt{8}} \approx 0.079$

$\boxed{1.392 < \mu < 1.551}$

SAMPLE DATA

approximation from TI-83

$n = 8 \quad df = 7$

$\bar{x} \approx 1.47$

$s \approx 0.064$

99% CI

$\alpha = 0.01 \quad \frac{\alpha}{2} = 0.005$

We are 99% confident that the true population mean amonia concentration is between 1.392 and 1.551 parts per million.

(b) $\sqrt{\frac{(n-1)s^2}{\chi^2_R}} < \sigma < \sqrt{\frac{(n-1)s^2}{\chi^2_L}}$

95% CI

$\alpha = 0.05 \quad \frac{\alpha}{2} = 0.025$

$\sqrt{\frac{(7)(.064)^2}{16.0128}} < \sigma < \sqrt{\frac{(7)(.064)^2}{1.6899}}$

$\boxed{0.0423 < \sigma < 0.1303}$

We are 95% confident that the true population standard deviation for amonia concentration is between 0.0423 and 0.1303 parts per million.

(4) $\bar{x} - E < \mu < \bar{x} + E$

Sample Data

$n = 33$

$\bar{x} = 3.39$

$\sigma = 0.81$

95% CI

$\alpha = 0.05$, $\frac{\alpha}{2} = 0.025$

(a) $E = Z_{\frac{\alpha}{2}} \cdot \frac{\sigma}{\sqrt{n}}$

$3.39 - E < \mu < 3.39 + E$

$E = (1.96) \cdot \frac{0.81}{\sqrt{33}} \approx 0.276$

$$\boxed{3.1136 < \mu < 3.6664}$$

We are 95% confident that the true population mean is between 3.1136 and 3.6664 on the children's risk perception scale.

(b) NMEAN for a potential 95% CI. $\alpha = 0.05$ $\frac{\alpha}{2} = .025$

$n = \left[Z_{\frac{\alpha}{2}} \cdot \frac{\sigma}{E} \right]^2$ $n = \left[(1.96) \frac{.81}{0.1} \right]^2$

n MUST BE 253

USING NMEAN

n must be $\boxed{253}$

(5) $H_0 : \mu = 7.5$

claim → $H_1 : \mu > 7.5$

$\alpha = 0.05$

✓ Claim
✓ Data
✓ α
✓ TS
✓ CV, PV
✓ CON

SAMPLE DATA

$n = 45$ $df = 44$

$\bar{x} = 8.0$

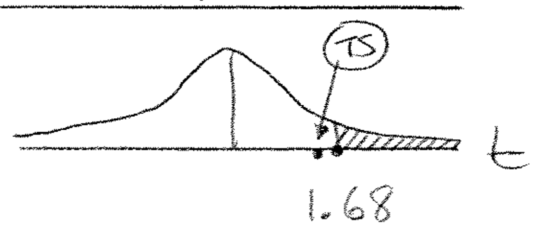
$s = 2.00$

TEST STATISTIC

$$t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}} \qquad t = \frac{8.0 - 7.5}{\frac{2.0}{\sqrt{45}}} \approx \boxed{1.677}$$

P-value $\approx$ $\boxed{0.0503}$ $\boxed{\text{Fail to Reject } H_0}$

CRITICAL VALUE



There is insufficient evidence to support the claim that the mean is greater than 7.5 minutes.

(6)

(a) use $\hat{p} = .70$ NPROP n must be $\boxed{2017}$

(b) There is sufficient evidence to support the claim that the mean annual rainfall is greater than 20 inches per year.

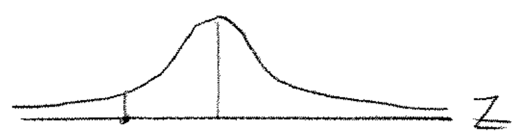
(c) $Z \approx \boxed{1.645}$

(d) YES. Samples vary and we want to know if this is usual sample variation OR a statistically significant sample variation.

(e) TEST STATISTIC $\chi^2 \approx \boxed{3.787}$ P-val ≈ 0.0004

$\boxed{\text{REJECT } H_0}$ assume $\alpha = 0.05$ (our choice)

(f) TWO TAILED TEST



TS: $Z = -2.231$

P-Value = 2 * normalcdf(-1E99, -2.231, 0, 1)

P-Value = 2 * 0.01284...

P-Value $\approx \boxed{0.026}$