REVIEW

1) Normal DISTRIBUTION of population

2) None, sample ~~xxx~~ should be appropriately neutral

3) Either find area from [0, 3.3] and subtract from 1 or $(8-3.3) \times 0.125 = 0.5875$

4) $P(n<6.1) = 6.1 \times 0.125 = 0.7625$

5) The amount is a z score so using the table z score of 1.13 ⇒ area of 0.8708

6) z score of Area 0.9599 (use table) = 1.75

7) $P(-2.41 \leq z \leq 0)$

Use Table find P(0) & P(-2.4)
Subtract $P(0) - P(-2.4) = 0.5 - 0.0080 = 0.4920$

8) The temperatures are normally distributed. Look at the z score for an area of 0.40 $\underline{-0.25°}$ is the score.

9) $z_{0.36}$ = z score with area of 0.36 to the <u>right</u>
area to right
Look at chart find area of $1-0.36$
$0.64 \Rightarrow z = 0.36$

10) Since mean = 100 & $\sigma = 15$ find z scores for 85 & 125 those are $-15/15 = -1$ and $\frac{25}{15} = 1.667$

Corresponding to areas of 0.9525 & 0.1587

$0.9525 - 0.1587 = 0.7938$

11) $\mu = 15.2$, $\sigma = 0.9$ $P(x > 15.2) = 0.50$
This is "obvious" because in a normal distribution half the values are above the mean and half below

12) Using Central Limit theorem, we calculate a standard deviation of $\sigma/\sqrt{n} = 14/\sqrt{49} = 2$. We calculate a z score of $\frac{91.8 - 89}{2} = 1.4$. This gives an area

of 0.9192 to the LEFT. Therefore the area DESIRED IS $1 - 0.9192 = 0.0808$

13) $z_{\alpha/2} \Rightarrow$ 91% confidence

91% confidence implies $\alpha/2 = 0.045$

$1 - 0.045 = 0.9550$

corresponds to z-score 1.70

14) $0.62 < p < 0.72 = p \pm E$

$E = (0.72 - 0.62)/2 = 0.05$

$0.62 + E = 0.67$

0.67 ± 0.05

15) $0.686 < p < 0.712$ find $\hat{p}$

$\hat{p} - E < p < \hat{p} + E$

$E = (0.712 - 0.686)/2 = 0.013$

$\hat{p} = 0.686 + 0.013 = 0.699$

16) 90% confidence, $n = 430$, $x = 80$, find E

* ROUND TO 5 DECIMAL places, I LOST 30 MIN by not ROUNDING my calculations *

$E = z_{\alpha/2}\sqrt{\frac{\hat{p}\hat{q}}{n}}$ $\hat{p} = \frac{80}{430}$ $\hat{q} = 1 - \hat{p}$ $\alpha = .10$

$z_{0.10/2} = z_{0.05} = 1.645$

$\hat{p} = \frac{80}{430} = 0.18605$ $\hat{q} = 0.81395$

$E = 0.03087$

17) 99% confidence, $n = 1180$ $\hat{p} = 45$

$\hat{q} = 55$ $\alpha = 0.05$

$z_{0.005} = 2.575$

$E = z_{0.01/2}\sqrt{\frac{(.45)(.55)}{1180}} = 0.0373$

18) $n = 96$, $x = 43$ 98%

$\hat{p} = 43/96$ $\qquad z_{0.02/2} = 2.33$

$$E = z_{0.} \sqrt{\frac{(.4479)(.5521)}{96}} = 0.11826$$

$\hat{p} - E < p < \hat{p} + E$

$0.330 < p < 0.566$

19) $E = 0.018$ confidence 99% $\hat{p}$ $\hat{q}$ UNKNOWN

$$n = \frac{[z_{\alpha/2}]^2 \, 0.25}{E^2} \qquad n = \frac{[2.575]^2 \, 0.25}{[0.018]^2} = 5116.222994$$

$n = 5117$

20) $E = 0.04$, conf 99% $\hat{p} = 0.14$ $\hat{q} = 1 - \hat{p} = 0.86$

USING $$n = \frac{[z_{\alpha/2}]^2 \hat{p}\hat{q}}{E^2} = \frac{[2.575]^2 (0.14)(0.86)}{[0.018]^2} = 498.95$$

$n = 497$

21) 91%, $n = 45$, σ IS KNOWN, skewed

$z_{0.09/2} = 1.70$

22) $H_0: p = \frac{2}{1000}$ $\qquad H_1: p < \frac{2}{1000}$

23) $H_0: \mu = 63500$

$H_1: \mu > 63500$

24) $\alpha = 0.09$ for right-tailed test

Use Chart $z_{0.9100} = 1.34$ find area of 0.9100

25) $\alpha = 0.05$ for left-tailed test

$z_{0.05} = -1.645$

26) $\alpha = 0.1$ for two tailed test

$z_{0.05} = \pm 1.645$

27) Statistic Right tailed test $z = 1.43$
Significance 0.05 implies $z = 1.645$

$1.43 < 1.645$ fail to Reject H_0

28) Asks for type 2 – Reject claim when true
H_0 – 3% of adults suffer from shyness
Fail to reject claim that 3% of adults suffer from shyness when > 3% suffer

29) H_0 mileage = 21 mpg

Type I – reject claim mileage = 21 when it is 21.