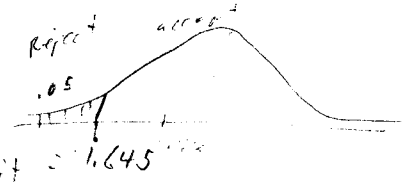
8.1 - 8.3

11 on the last page

4 a-b) $H_0: \mu = 84$ $H_A: \mu < 84$

c) $\alpha = .05$

d) at $\alpha = .05$ with a one sided test



$z_{obs} = \frac{83.8 - 84}{3.9/\sqrt{40}} = -.436$ $z_{obs} < z_{crit}$ fail to reject H_0

8 $H_0: \mu = 3$
$H_A: \mu > 3$ one sided test $\alpha = .05$ $z_{crit} = 1.645$ $z_{obs} = \frac{3.1\bar{x} - 3}{.21/\sqrt{15}} = 1.361$

$z_{obs} < z_{crit}$ fail to reject H_0

12 a-c) $H_0: \mu = 4.8$ $H_A: \mu > 4.8$ need to see if $\bar{x}$

d) $\alpha = .01$ is the prob of falsely rejecting H_0, of showing that the company is operating at an acceptable level when in fact $\mu = 4.8$

c) $z_{crit} = 2.33$ so rejection region $z > 2.3$

f) $z_{obs} = \frac{4.87 - 4.8}{.3/\sqrt{80}} = 1.6$ $z_{obs} < z_{crit}$ fail to reject H_0 - evidence does not suggest that average profits are greater than 4.8%

15 $H_0: \mu = 44.7$ $t_{obs} = \frac{45.273 - 44.7}{1.199/\sqrt{30}} = 2.62$ $df = 29$ $\alpha = .05$ two sided test
$H_A: \mu \neq 44.7$ $t_{\alpha/2} = 2.045$

$t_{obs} > t_{crit}$ reject H_0 - we can reasonably say the mean is not 44.7

78 a) $\bar{x}$ is normally distributed (assumed by CLT if $n \geq 30$

b) σ is unknown, and n is large, so that a good approximation for $\sigma_{\bar{x}}$ can be used

81 b) $H_0: \mu = 23.20$ $\alpha = .01$ $n = 90$ large enough sample

$H_A: \mu < 23.20$ consider $z_\alpha = -2.326$

$$z_{obs} = \frac{21.2 - 23.2}{4.5/\sqrt{40}} = -2.811$$

$z_{obs} > z_{crit}$ - reject H_0 that the ave would be 23.2 with our sample / so we would say the company is paying interior wages

100 $H_0: \mu = 48,000$ $n = 12$ so not large enough to use z distribution

$H_A: \mu > 48,000$ $d.f. = 12 - 1 = 11$ one sided test with $\alpha = .05$

$t_{crit} = 1.796$ $t_{obs} = \frac{51,102 - 48,000}{512.7/\sqrt{12}} = 2.096$

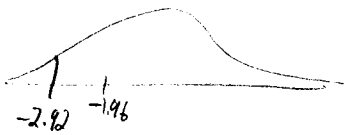
$t_{obs} > t_{crit}$ reject H_0 - there is something abnormal here

120 a) $n = 3$ $\bar{y} = 2.43$ $s^2 = \frac{(2.5 - 2.43)^2 + (1.9 - 2.43)^2 + (2.9 - 2.43)^2}{2} = .253$

$s = .503$

$H_0: \mu = 3$ $d.f. = 2$ use t $\alpha = .05$ one sided $t_{crit} = -2.92$

$H_A: \mu < 3$ $t_{obs} = \frac{2.43 - 3}{.503/\sqrt{3}} = -1.96$



fail to reject H_0 - insufficient evidence to conclude the average is less than 3

b) $2.433 \pm 2.92\sqrt{\frac{.253}{3}}$ $2.433 \pm .849$

$t_{\alpha/2} = 2.92$

$df = 2$

11. a-b) $H_0: \mu = 19$ $H_A: \mu > 19$

c) $\alpha = .05$ $d.f. = 3-1 = 2$ $t_{.05} = 2.92$

d) $\bar{x} = \frac{22+12+31}{3} = 21.667$ $s^2 = \frac{(22-21.66)^2 + (12-21.66)^2 + (31-21.66)^2}{2} = 96.333$

$s = 9.5$

$t_{obs} = \frac{21.667 - 19}{\frac{9.5}{\sqrt{3}}} = .486$

$t_{crit} > t_{obs}$

.486 < 2.92

fail to reject H_0

there is insufficient evidence to indicate μ is greater than 19