MTH 481 Assignment #13 SOLUTIONS

2 (p. 438)

(1). a) Reject H_0 if $TS < -z_\alpha = -z_{0.08}$

$$TS = \frac{\bar{y}-\mu}{\sigma/\sqrt{n}} = \frac{114.2-120}{18/\sqrt{25}} = -1.611$$

b) Reject H_0 if $|TS| > z_{\alpha/2} = z_{0.005}$

$$TS = \frac{\bar{y}-\mu}{\sigma/\sqrt{n}} = \frac{45.1-42.9}{3.2/\sqrt{16}} = 2.75$$

c) Reject H_0 if $TS > z_\alpha = z_{0.13}$

$$TS = \frac{\bar{y}-\mu}{\sigma/\sqrt{n}} = \frac{15.8-14.2}{4.1/\sqrt{9}} = 1.17$$

(4) $H_0: \mu = 32,500$

$H_1: \mu > 32,500$

$$TS = \frac{\bar{y}-\mu}{\sigma/\sqrt{n}} = \frac{33,800-32,500}{4000/\sqrt{15}}$$

Reject H_0 if $TS > z_\alpha = z_{0.05}$

(8) a) p-value $= P(Z \leq TS) = P(Z \leq -1.611)$

b) p-value $= P(|Z| \geq |TS|) = 2P(Z \geq 2.75)$

c) p-value $= P(Z \geq TS) = P(Z \geq 1.17)$

3 (p. 445)

① a) $H_0 : p = 0.4$

$H_1 : p > 0.4$

$\alpha = 0.05$

$$TS = \frac{\hat{p} - p}{1/2\sqrt{n}} = \frac{\frac{24}{52} - 0.4}{1/2\sqrt{52}} = 0.887$$

Reject H_0 if $TS > z_\alpha = z_{0.05}$

b) p-value $= P(Z \geq TS) = P(Z \geq 0.887)$

$= 1 - \Phi(0.887) = 0.1867$

$\Rightarrow$ would reject H_0 for $\alpha \geq 0.1867$

4 (p. 492)

(18) $H_0: \mu = 132.4$

$H_1: \mu \neq 132.4$

$$TS = \frac{\hat{\mu} - \mu}{s/\sqrt{n}} = \frac{143.8 - 132.4}{6/\sqrt{84}}$$

Reject H_0 if

$$|TS| \geq t_{\frac{\alpha}{2}, n-1} = t_{0.025, 83}$$

(21) $H_0: \mu = 0.0042$

$H_1: \mu < 0.0042$

$$TS = \frac{\hat{\mu} - \mu}{s/\sqrt{n}} = \frac{\hat{\mu} - 0.0042}{0.00383/\sqrt{10}}$$

Reject H_0 if

$$TS < -t_{\alpha, n-1} = -t_{0.05, 9}$$