

Question 5

$$(a) (\bar{X}_1 - \bar{X}_2) + t_{\alpha} \left(s \sqrt{\frac{1}{n_1} + \frac{1}{n_2}} \right)$$

95% CI

$$= 1.94 \text{ to } 10.06$$

(b) different from that of for twelfth-graders

Question 3

$$n_1 = 48$$

$$n_2 = 38$$

$$\bar{X}_1 = 31.73$$

$$\bar{X}_2 = 32.02$$

$$s_1 = 42.3$$

$$s_2 = 50.1$$

$$\alpha = 0.05$$

$$= -49.26 < \mu_1 - \mu_2 < 8.74$$

Question 2.

$$(a) \text{ point estimate } \mu_1 - \mu_2 = 10.7273 - 16.0833$$

$$= -5.356$$

(b) Confidence interval, 80%

$$= -7.07 \text{ to } -3.64$$

(c) P-value = 0.0002 Reject H_0

μ_1 is lower than μ_2

Question 1

$$\mu_1 - \mu_2 = 13.87 - 16.47 = -2.6$$

Question 5

$$n_1 = 207$$
$$\bar{x}_1 = 4.55$$
$$\sigma_1 = 1.22$$

$$n_2 = 293$$
$$\bar{x}_2 = 4.8$$
$$\sigma_2 = 1.47$$

$$(a) (\bar{x}_1 - \bar{x}_2) \pm z_{\alpha} \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$
$$= (4.55 - 4.8) \pm 2.33 \sqrt{\frac{1.22^2}{207} + \frac{1.47^2}{293}}$$

$$= -0.53 \text{ to } 0.03$$

$$(b) H_0: \mu_1 = \mu_2$$
$$H_a: \mu_1 < \mu_2$$

$$z = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}} = \frac{(4.55 - 4.8)}{\sqrt{\frac{1.22^2}{207} + \frac{1.47^2}{293}}}$$

$$Z_{\text{observed}} = -2.07$$

Reject

$$(c) P\text{-value} = 0.0192$$

For $\alpha = 0.01$, do not reject

Question 4

$$n_1 = 30$$
$$\bar{x}_1 = 110$$
$$\sigma_1 = 15$$

$$n_2 = 27$$
$$\bar{x}_2 = 85$$
$$\sigma_2 = 10$$

$$(a) \mu_1 - \mu_2 = 110 - 85 = 25$$

$$(b) = \sqrt{\frac{15^2}{30} + \frac{10^2}{27}} = 3.3472$$

$$= 2.17 \times 3.3472 = 7.26$$

(c) Mean elapsed are different

Question 2

$$(a) \mu_1 - \mu_2 = 24.8 - 26.6 \\ = -1.8$$

$$b) -3.15 \quad t_0 = -0.45$$

$$MOE = 1.35$$

Question 1

98% confidence interval

$$0.95 \text{ to } 1.67$$

Question 7

$$(a) Z_{observed} = \frac{0.61 - 0.69}{\sqrt{\frac{0.69(1-0.69)}{1975}}} = -7.38$$

$$Z_{left} = -2.33 \quad Z_{right} = 2.33$$

$$(b) \text{different, actually} \\ = 0.02$$

$$(c) p\text{-value} = 0.0001$$

For $\alpha = 0.06$, we reject H_0

Question 6

$$(a) Z_0 = \frac{0.82 - 0.8}{\sqrt{\frac{0.8(1-0.8)}{500}}} = 1.12$$

$$Z_{left} = -2.33$$

$$Z_{right} = 2.33$$

Reject

$$(b) = 0.02$$

$$(c) p\text{-value} = 0.2628$$

$$\alpha = 0.06, \text{ fail to reject}$$

$$\alpha = 0.05, \text{ fail to reject}$$

9.4 Question 2

$$(a) -\cancel{1.96} -1.64$$

$$(b) Z = -1.96 \text{ or } Z = 1.96$$

$$(c) Z = 1.64$$

9.3 Question 7

$$\mu = 34400$$

$$X = 37000$$

$$s = 5490$$

$$n = 490$$

$$t = \frac{37000 - 34400}{\frac{5490}{\sqrt{490}}} = 10.4833$$

$$0.0001 < p\text{-value} < 0.0005$$

$$0 < p\text{-value} < 0.0001$$

$$\text{Observed} = 10.4833$$

$$\text{Critical} = 1.28$$

higher than

9.3 Question 6

$$t = \frac{625000 - 650000}{\frac{105000}{\sqrt{75}}} = -2.0062$$

$$0.02 < p < 0.05$$

$$\text{Observed} = -2.0062$$

$$\text{critical} = -1.667$$

$$\text{critical} = 1.667$$

equal to

Question 5

$$\bar{x} = 21.21$$

$$s = 6.479$$

The claim is false

9.3 Question 1

$$(a) 0.025 < p < 0.05$$

$$t_{\text{critical}} = 2.583$$

$$t_{\text{observed}} = -1.855$$

$$(b) 0.05 < p < 0.1$$

$$t_{\text{left}} = -2.921$$

$$t_{\text{right}} = 2.921$$

$$t_{\text{observed}} = -1.855$$

9.2 Question 9.

$$Z = \frac{25.6 - 29}{\frac{8}{\sqrt{25}}} = -2.125$$

$$p = 0.0336$$

Question 8

E - Your result is significant at $\alpha = 0.05$ because $0.04 < 0.05$

A - Your result is not significant at $\alpha = 0.01$

B - Your result is significant at $\alpha = 0.05$

Question 7

$$\mu = 1222 \quad n = 97, \quad x = 1192, \quad \sigma = 227$$

$$(a) \quad Z = \frac{1192 - 1222}{\frac{227}{\sqrt{97}}} = -1.3016$$

$$p\text{-value} = 0.0965$$

Do not reject

$$(b) \quad Z_{\text{observed}} = -1.3$$

Do not reject

Water per household has not decreased

9.2 Question 2

$$Z_{\text{critical}} = 1.96$$

$$Z_{\text{observed}} = \frac{30 - 28}{\frac{8}{\sqrt{125}}} = 2.81$$

9.2 Question 1

$$(a) \quad Z = \frac{74.8 - 72}{\frac{6}{\sqrt{16}}} = 1.87$$

$$p\text{-value} = 0.031$$

(b) Do not reject

Do not reject