

Name _____

1a.) $H_0: \mu_d = 0$ $H_1: \mu_d < 0$ $t = -2.827$
P-value $.01 < p < .025$ Conclusion $p\text{-value} > \alpha$, fail to reject H_0 & fail to claim H_1 . The prep course is not effective.

8

b.) $t_{\alpha/2} = 2.896$ CI: $(-231.69, 2.81)$
Conclusion: We are 98% confident the interval $(-231.69, 2.81)$ contains the pop. mean difference in SAT scores. 0 is in CI, no difference.

10

2a.) $r = .866$ Linear? Yes CV: .666

10

b.) $\hat{y} = 15.55 + 1.25x$ c.) 28.3

3a.) $r = -.475$ Linear? NO CV: .632

8

b.) _____ c.) 59.3

4a.) $H_0: p_1 = p_2$ $H_1: p_1 > p_2$ $z = 4.13$
P-value .0001 Conclusion $P\text{-value} < \alpha$, reject H_0 & claim H_1 . Prop. of student who rent calculators is ~~lower~~ higher at college than university.

8

b.) $z_{\alpha/2} = 1.645$ CI: $(.155, .345)$
Conclusion: We are 90% confident the interval $(.155, .345)$ contains the pop. difference in prop. of calculator renters. 0 is not in CI, there is a difference.

10

5a.) $H_0: \mu_1 = \mu_2$ $H_1: \mu_1 \neq \mu_2$ $t = 1.12$
P-value $> .20$ Conclusion $P\text{-value} > \alpha$, fail to reject H_0 & fail to claim H_1 . The gas stations do not have different prices.

8

b.) $t_{\alpha/2} = 3.499$ CI: $(-.445, .865)$
Conclusion: We are 99% confident the interval $(-.445, .865)$ contains the difference in gas prices. 0 is in CI, there is no difference.

10

6.) $H_0: p = .75$ $H_1: p \neq .75$ $z = 1.63$
P-value .1032 Conclusion $p\text{-value} > \alpha$, fail to reject H_0 & fail to claim H_1 . We keep the claim that 75% eat dessert.

9

7.) $H_0: \mu = 30$ $H_1: \mu > 30$ $t = 6.003$
P-value $< .005$ Conclusion $p\text{-value} < \alpha$, reject H_0 & claim H_1 . The mean wait time is above 30 min.

10

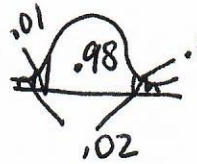
8.) $H_0: \sigma = 10$ $H_1: \sigma \neq 10$ $\chi^2 = 42.59$
P-value ~~0.0001~~ $< .01$ Conclusion $p\text{-value} < \alpha$, reject H_0 & claim H_1 . The standard deviation is not 10.

9

-100 100 -200 -120 -60 -330 -30 -90 -200

$$d = -114.44 \quad sd = 121.46$$

$$t = \frac{-114.44}{\left(\frac{121.46}{\sqrt{9}}\right)} = -2.827 \quad df = 8$$

b.)  $E = 2.896 \cdot \frac{121.46}{\sqrt{9}} = 117.25$

$$-114.44 - 117.25 < \mu_d < -114.44 + 117.25$$

2a.) $\sum x = 73.8 \quad \sum x^2 = 1376.22 \quad n = 9 \quad \bar{y} = 25.77$
 $\sum y = 231.9 \quad \sum y^2 = 7573.03 \quad \sum xy = 2862.4$

$$r = \frac{9 \cdot 2862.4 - 73.8 \cdot 231.9}{\sqrt{9 \cdot 1376.22 - 73.8^2} \sqrt{9 \cdot 7573.03 - 231.9^2}} = .866$$

b.) $b_0 = \frac{231.9 \cdot 1376.22 - 73.8 \cdot 2862.4}{9 \cdot 1376.22 - 73.8^2} = 15.55$

$$b_1 = \frac{9 \cdot 2862.4 - 73.8 \cdot 231.9}{9 \cdot 1376.22 - 73.8^2} = 1.25$$

$$\hat{y} = 15.55 + 1.25x$$

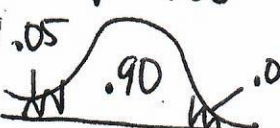
c.) $\hat{y} = 15.55 + 1.25(10.2) = 28.3$

3.) a.) $\sum x = 785 \quad \sum x^2 = 61807 \quad n = 10 \quad \bar{y} = 59.3$
 $\sum y = 593 \quad \sum y^2 = 35239 \quad \sum xy = 46495$

a.) $r = \frac{10 \cdot 46495 - 785 \cdot 593}{\sqrt{10 \cdot 61807 - 785^2} \sqrt{10 \cdot 35239 - 593^2}} = -.475$

4.) $\hat{p}_1 = \frac{86}{120} = .717 \quad \hat{q}_1 = .283 \quad \bar{p} = \frac{86 + 70}{120 + 150} = .578$
 $\hat{p}_2 = \frac{70}{150} = .467 \quad \hat{q}_2 = .533 \quad \bar{q} = .422$

a.) $z = \frac{(.717 - .467)}{\sqrt{\frac{.578 \cdot .422}{120} + \frac{.578 \cdot .422}{150}}} = 4.13$

b.)  $E = 1.645 \sqrt{\frac{.717 \cdot .283}{120} + \frac{.467 \cdot .533}{150}} = .095$

$$(.717 - .467) - .095 < \mu_1 - \mu_2 < (.717 - .467) + .095$$

$$.155 < \mu_1 - \mu_2 < .345$$

$$\textcircled{6} \hat{p} = \frac{160}{200} = .8$$

$$P\text{-value} = 2(1 - .9484) = .1032$$

$$z = \frac{.8 - .75}{\sqrt{\frac{.75 \times .25}{200}}} = 1.63$$

$$\textcircled{7} \bar{x} = 59.07 \quad s = 18.12 \quad n = 14$$

$$t = \frac{59.07 - 30}{\left(\frac{18.12}{\sqrt{14}}\right)} = 6.003 \quad df = 13$$

$$\textcircled{8} \chi^2 = \frac{(14-1) \cdot 18.12^2}{10^2} = 42.68 \quad df = 13$$

$$P\text{-value} \leq 2(.005) = .01$$

$$\textcircled{9} \bar{x}_1 = 3.67 \quad s_1 = .303 \quad n_1 = 8$$

$$\bar{x}_2 = 3.46 \quad s_2 = .486 \quad n_2 = 10$$

$$a) t = \frac{(3.67 - 3.46)}{\sqrt{\frac{.303^2}{8} + \frac{.486^2}{10}}} = 1.12 \quad df = 7$$



.01 in 2 tails $df = 7$

$$E = 3.499 \sqrt{\frac{.303^2}{8} + \frac{.486^2}{10}} = .655$$

$$(3.67 - 3.46) - .655 < \mu_1 - \mu_2 < (3.67 - 3.46) + .655$$