

SOLUTIONS

① ① $H_0: \mu = 60$

$H_1: \mu \neq 60$

② $\alpha = .05$

③ Data: Test statistic
 $n=8$
 $\bar{x} = 71.3$
 $s = 15.1$
 $t = \frac{(71.3 - 60)}{(15.1/\sqrt{8})}$ d.f. = $n-1$

$= 2.117$ d.f. = $8-1=7$

④ p-value

$1.895 < 2.117 < 2.365$

$.05 > \downarrow \text{p-value} > .025$

Double? yes ($H_1: \mu \neq 60$)

$\Rightarrow$ use $.10 > \text{p-value} > .05$

⑤ Decision:

$.10 > \text{p-value} > .05$
 α

$\Rightarrow \text{p-value} > \alpha$

$\Rightarrow$ Do Not Reject H_0

② ① $H_0: \mu \leq 110$

$H_1: \mu > 110$

② $\alpha = .05$

③ Data: Test Statistic

$n=57$

$\bar{x} = 113.8$

$s = 9.6$

$t = \frac{(113.8 - 110)}{(9.6/\sqrt{57})}$

$(9.6/\sqrt{57})$

d.f. = $n-1$

$= 57-1$

$= 56$

$= 2.988$ d.f. = 56

④ p-value

$2.923 < 2.988 < 3.242$

$\downarrow \downarrow$
 $.0025 > \text{p-value} > .001$

Double? No

⑤ Decision:

$.05 > .0025 > \text{p-value} > .001$
 α

$\Rightarrow \text{p-value} < \alpha$

$\Rightarrow$ Reject H_0

③ $H_0: \mu = 100.7$
 $H_1: \mu \neq 100.7$

② $\alpha = .05$

③ Data: $n = 39$
 $\bar{x} = 94.3$
 $s = 22.1$

Test Statistic:
 $t = \frac{94.3 - 100.7}{22.1/\sqrt{39}}$
 $d.f. = n - 1 = 39 - 1 = 38$

$\Rightarrow t = -1.809$ $d.f. = 38$

we may ignore the negative sign

use $t = 1.809$ $d.f. = 38$

④ p-value:
 $1.686 < 1.809 < 2.024$
 $\downarrow \quad \downarrow \quad \downarrow$
 $.05 > p\text{-value} > .025$

Double? yes

use $.10 > p\text{-value} > .05$

⑤ Decision:

$.10 > p\text{-value} > .05$

$\therefore p\text{-value} > \alpha$

$\Rightarrow$ Do NOT Reject H_0

④ $H_0: \mu \geq 57.8$
 $H_1: \mu < 57.8$

② $\alpha = .05$

③ Data: $n = 5$
 $\bar{x} = 56.1$
 $s = 2.9$
 assuming Normal Distribution

test statistic:
 $t = \frac{56.1 - 57.8}{(2.9/\sqrt{5})}$
 $d.f. = n - 1 = 5 - 1 = 4$

$\Rightarrow t = -1.311$

we may ignore the negative sign.

use $t = 1.311$ $d.f. = 4$

④ p-value:
 $1.190 < 1.311 < 1.533$
 $\downarrow$
 $.15 > p\text{-value} > .10$
 Double? No

⑤ Decision

$.15 > p\text{-value} > .10 > .05$

$\therefore p\text{-value} > \alpha$

$\Rightarrow$ Do NOT Reject H_0