

1. $H_0: \mu = 70$ $H_1: \mu \neq 70$ or $H_1: \mu > 70$

Test stat: $t = \frac{72.08036 - 70}{2.191159/\sqrt{28}} = 5.0239$

P-value: 2.856×10^{-5} or 1.428×10^{-5} (for H_1 and H_1' , respectively)

Reject H_0 in either case.

2. $H_0: \theta = \frac{1}{3}$ $H_1: \theta > \frac{1}{3}$

Test stat: $Z = \frac{346 - \frac{1}{3}(855)}{\sqrt{855(\frac{1}{3})(\frac{2}{3})}} = 4.4254$

P-value: 4.8132×10^{-6}

Reject H_0

3. a) $H_0: \mu = 3200$ $H_1: \mu < 3200$

test stat: $t = \frac{3107 - 3200}{188/\sqrt{45}} = -3.3184$

P-value: .000912

Reject H_0 .

b) $H_0: \sigma = 200$ $H_1: \sigma < 200$

test stat $\chi^2 = \frac{44(188)^2}{(200)^2} = 38.8784$

P-value: .3096

Fail to reject H_0 . This is not strong evidence that σ is less than 200.

4. a) $H_0: \theta = \frac{1}{2}$ $H_1: \theta > \frac{1}{2}$

Test stat: $Z = \frac{80 - 124(\frac{1}{2})}{\sqrt{124(\frac{1}{2})(\frac{1}{2})}} = 3.2329$

P-value: .00061

Reject H_0 . More than half lean right.

b) $H_0: \theta = \frac{2}{3}$ $H_1: \theta < \frac{2}{3}$

Test stat: $Z = \frac{80 - 124(\frac{2}{3})}{\sqrt{124(\frac{2}{3})(\frac{1}{3})}} = -.5080$

P-value: .3057

Fail to reject H_0 . It is plausible that $\frac{2}{3}$ lean right.

5. a) $H_0: \mu_1 - \mu_2 = 0$ $H_1: \mu_1 - \mu_2 > 0$

Test stat: $t = \frac{72.08036 - 70.82353}{s_p \sqrt{\frac{1}{26} + \frac{1}{34}}} = 2.0146$

$s_p^2 = \frac{27(2.191158)^2 + 33(2.633935)^2}{60} = 5.9762$

P-value: .0242

Reject H_0 at 5% significance level.

b) Test stat $f = \frac{(2.191158)^2}{(2.633935)^2} = .6920$

The test stat is not in the rejection region: fail to reject H_0 .

P-value: .1650.

c) $H_0: \mu = 0$ $H_1: \mu > 0$

Test stat $t = \frac{1.046296 - 0}{3.008032/\sqrt{27}} = 1.8074$

P-value: .0411

Reject H_0 at 5% significance level.