23-1   Matched Pairs

a) μ_H = mean age of husbands
μ_w = " " " wives

$H_0 : \mu_H = \mu_w$

$H_a : \mu_H > \mu_w$ df = 45.8 (calc)

not sign. @
$\alpha = .05$
fail to reject H_0

$t = \dfrac{35.71 - 33.83}{\sqrt{\dfrac{14.56^2}{24} + \dfrac{13.56^2}{24}}}$

$t = .46$

$Pr(t > .46) = .32$

b) $\underbrace{(35.71 - 33.83)}_{1.875} \pm t^*_{45.8} \sqrt{\dfrac{14.56^2}{24} + \dfrac{13.56^2}{24}}$

$(-4.938, 8.6983)$

e) $n = 24$
$\bar{x}_d = 1.875$
$S_d = 4.812$

$1.875 \pm 1.714 \dfrac{4.812}{\sqrt{24}}$

$(.19, 3.56)$

f) ☆ midpt is same (diff.)
   1.875
☆ much less var. when paired

g) μ_d = mean diff. in ages (husb. − wife)

$H_0 : \mu_d = 0$

$H_a : \mu_d > 0$ husb. older

$t = \dfrac{1.875}{\dfrac{4.812}{\sqrt{24}}} = 1.91$

$Pr(t > 1.91) = .0344$

sign @
$\alpha = .05$
reject H_0

23-5
23-7
23-8

23-1   Matched Pairs

a) μ_H = mean age of husb.

   μ_w = "   "   "   wives

$H_0: \mu_H = \mu_w$

$H_a: \mu_H > \mu_w$

$$t = \frac{35.71 - 33.83}{\sqrt{\frac{14.56^2}{24} + \frac{13.56^2}{24}}}$$

$df = 45.8$ (calc) $t = .46$

not sign
$\alpha = .05$
fail to reject H_0

$Pr(t > .46) = .32$

b) $\underset{(1.875)}{(35.71 - 33.83)} \pm t^*_{45.8} \sqrt{}$

$(-4.938, 8.6983)$ 0 is inc.

e) $\underset{\underset{\text{mean diff.}}{\downarrow}}{1.875} \pm 1.714 \left(\frac{4.812}{\sqrt{24}}\right)$ $d.f. = 23$

$(.19, 3.56)$

f)   midpt: same ($\overset{\text{avg.}}{\text{diff}}$)

    (dec. var. w/ matched pairs)

g) μ_d = mean diff. in ages (husb. - wife)

$H_0: \mu_d = 0$

$H_a: \mu_d > 0$

$$t = \frac{1.875}{\frac{4.812}{\sqrt{24}}} = 1.91$$

23-5 ✓

23-7

23-8

$Pr(t > 1.91) = .0344$

$\alpha = .05$
is sign.
reject H_0

23-1 Matched Pairs

a) μ_H = mean age of husb....
   μ_W = " " " wives

$H_0: \mu_H = \mu_W$
$H_a: \mu_H > \mu_W$

$$t = \frac{35.71 - 33.83}{\sqrt{\frac{14.56^2}{24} + \frac{13.56^2}{24}}}$$

b) $(35.71 - 33.83) \pm t^*$ df = 45.8 (calc) $t = .46$
   $\underbrace{\quad}_{1.88}$ $\underbrace{\quad}_{45.8}$ $Pr(t > .46) = .32$

$(-4.938, 8.6983)$ $\alpha = .05$
                        not sign.
   0 is inc.   fail to reject H_0

e)   df = 23
   $1.875 \pm 1.714 \left(\frac{4.812}{\sqrt{24}}\right)$

   $(.19, 3.56)$

f) same midpt $\left(\overset{avg}{diff.}\right)$
   decreased variability (matched pairs)
                                ↓
g) μ_d = mean diff in couples' ages   blocking
           (husb - wife)

$H_0: \mu_d = 0$ $t = \frac{1.875}{4.812/\sqrt{24}} = 1.91$
$H_a: \mu_d > 0$

23-5 ✓   df = 23 $Pr(t > 1.91) = .0344$

23-7 $\alpha = .05$ sign.
 23-8   reject H_0