(1) $H_0: \mu_d = 0$

Claim → $H_1: \mu_d > 0$

$\alpha = 0.05$

✓ Claim
✓ Data
✓ α
✓ TS
✓ PV
✓ CON

Sample Data

SUBJECT	A	B	C	D	E	F	H	I
BEFORE	134	122	118	130	144	125	127	133
AFTER	130	120	123	127	138	121	132	135
DIFFERENCE	4	2	-5	3	6	4	-5	-2

$n = 8 \quad df = 7$

$\bar{d} = 0.875$

$s_d \approx 4.29$

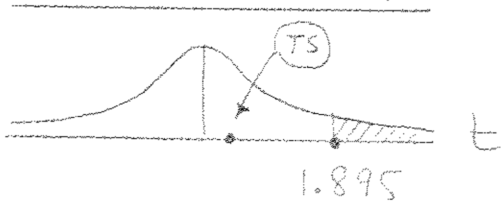
TEST STATISTIC

$$t = \frac{\bar{d} - \mu_d}{\frac{s_d}{\sqrt{n}}} \qquad t = \frac{.875 - 0}{\frac{4.29}{\sqrt{8}}} \approx \boxed{0.577}$$

P-Value $\approx \boxed{0.291}$

$\boxed{\text{Fail to Reject } H_0}$

CRITICAL VALUE



There is NOT sufficient evidence to support the claim that jogging lowers blood pressure.

(2) claim → $H_0 : \mu_1 = \mu_2$

$H_1 : \mu_1 \neq \mu_2$

$\alpha = 0.05$

✓ Claim
✓ Data
✓ α
✓ TS
✓ PV
✓ CON

SAMPLE DATA

NONSMOKERS	SMOKERS
$n_1 = 32$	$n_2 = 35$
$\bar{x}_1 = 3480$	$\bar{x}_2 = 3260$
$s_1 = 9.2$	$s_2 = 10.4$

TEST STATISTICS

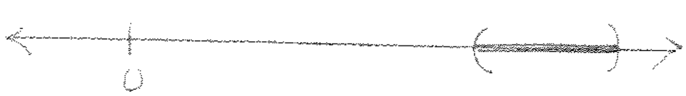
$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \qquad t = \frac{(3480 - 3260) - 0}{\sqrt{\frac{(9.2)^2}{32} + \frac{(10.4)^2}{35}}} \approx \boxed{91.86}$$

P-value $\approx \boxed{1.8E-70}$

$\boxed{\text{REJECT } H_0}$

There is sufficient evidence to reject the claim that the mean weight of smoking mothers is the same as nonsmoking mothers.

15 % CI for $\mu_1 - \mu_2$ (215.22 , 224.78)



Interval does NOT contain zero so this is strong evidence against the null hypothesis. We should REJECT H_0.

(3) claim → $H_0: \mu_1 = \mu_2 = \mu_3$

H_1: at least one mean is NOT equal

$\alpha = 0.05$ (our choice)

✓ Claim
✓ Data
✓ α
✓ TS
✓ PV
✓ CCN

TEST STATISTIC

Calculator only

$F \approx \boxed{0.411}$

P-Value $\approx \boxed{0.670}$

$\boxed{\text{Fail to Reject } H_0}$

There is NOT sufficient evidence to reject the claim that the mean fat content is the same for all three brands.

CALCULATED DATA

BRAND 1	BRAND 2	BRAND 3
$n = 6$	$n = 6$	$n = 6$
$\bar{x} = 32.5$	$\bar{x} \approx 34.2$	$\bar{x} = 34$
$S \approx 1.87$	$S = 3.76$	$S = 4.38$

(4) claim → $H_0: P_1 = .38,\ P_2 = .32,\ P_3 = .26,\ P_4 = .04$

H_1: at least one proportion is NOT equal to the given proportions

$\alpha = 0.05$

Claim
Data
α
TS
PV
CON.

$n = 500 \quad k = 4 \quad df = 3$

Sample Data

GRADE	TOP	HIGH	MEDIUM	LOW
OBSERVED	222	171	98	9
EXPECTED	190	160	130	20

TEST STATISTIC

$$\chi^2 = \sum \frac{(O-E)^2}{E} \qquad \chi^2 = \frac{(222-190)^2}{190} + \cdots + \frac{(9-20)^2}{20}$$

$$\approx 5.39 + \cdots + 6.05$$

$$\approx \boxed{20.07}$$

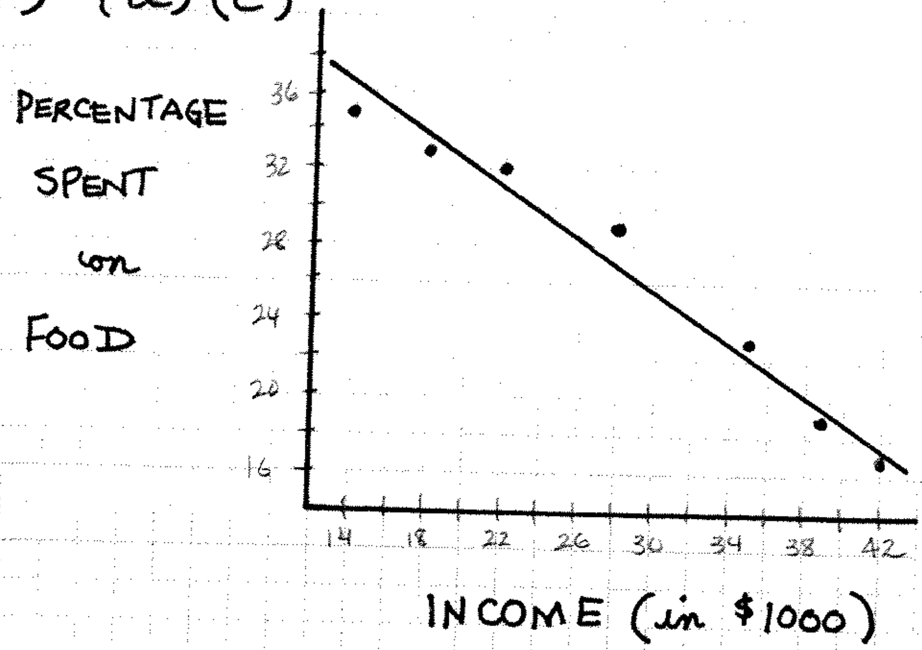
P-Value $\approx 1.6E-4$

$\approx \boxed{0.00016}$

$\boxed{\text{REJECT } H_0}$

There is sufficient evidence to reject the claim that the new machine does the job with the given proportions in each grade as the old machine.

(5) (a)(e)



(b) $\boxed{r \approx -0.986}$ TS: $t \approx -13.32$ P-Value $\approx$ 4.3 E-5 ≈ 0.00004

REJECT H_0

(c) $\boxed{\text{SIG. NEG. LIN. CORR.}}$

(SIGNIFICANT NEGATIVE LINEAR CORRELATION)

(d) $\boxed{\hat{y} \approx 45.4 - 0.66X}$

(e) see above

(f) $r^2 \approx 0.973$ $\boxed{97.3\%}$

(g) $\hat{y}(25) \approx \boxed{29.0\%}$

(h) 95% P. I. $n=7$ $df=5$ CV: 2.571

$\boxed{(25.4,\ 32.6)}$

(6) claim → $H_0 : P_1 = P_2$

$H_1 : P_1 \neq P_2$

$\alpha = 0.05$

✓ Claim
✓ Data
✓ α
✓ TS
✓ PV
✓ CON

Sample Data

MEN	WOMEN
$n_1 = 275$	$n_2 = 325$
$x_1 = 18$	$x_2 = 31$
$\hat{p}_1 = 18/275$	$\hat{p}_2 = 31/325$
$\hat{p}_1 \approx 0.065$	$\hat{p}_2 \approx 0.095$

$\bar{q} \approx 1 - 0.082 \approx 0.918$

$\bar{p} = \dfrac{18 + 31}{275 + 325} \approx 0.082$

TEST STATISTIC

$$Z = \frac{(\hat{p}_1 - \hat{p}_2) - (p_1 - p_2)}{\sqrt{\dfrac{\bar{p}\bar{q}}{n_1} + \dfrac{\bar{p}\bar{q}}{n_2}}} \qquad Z = \frac{(.065 - .095) - 0}{\sqrt{\dfrac{(.082)(.918)}{275} + \dfrac{(.082)(.918)}{325}}}$$

$Z \approx \boxed{-1.33}$ P-Value $\approx \boxed{0.182}$

$\boxed{\text{Fail to Reject } H_0}$

There is NOT sufficient evidence to reject the claim that the proportions of male and female listeners are the same.

(7) (a) P-value ≈ 0.142 NO LIN. CORR. $\boxed{\bar{y} = 7.5}$

(b) P-Value ≈ 0.019 SIG. POS. LIN. CORR. $\boxed{\hat{y} = 23.2}$

(c) Ho: Rehospitalization is INDEPENDENT of discharge time.
H₁: Rehospitalization DEPENDS on discharge time.

$\chi^2 \approx \boxed{5.297}$ P-Value ≈ $\boxed{0.021}$

$\boxed{\text{Fail to Reject Ho}}$

(d) $r^2 = (-0.90)^2 = \boxed{0.81}$

81% of the variation in gasoline fuel mileage can be explained by the variation in the weight of a car.

(e) (0.052, 0.091) Interval DOES NOT contain zero.

$\boxed{\text{REJECT Ho}}$

There is sufficient evidence to support the claim that the proportion of vinyl gloves with a virus leak is larger than the proportion of latex gloves with a virus leak.