

Name:

Statistics

Date:

Practice Quiz 8-F

1. Sixteen college women record their total weight gain in their first semester of college. The six non-vegetarians gained 8.6, 6.4, 3.0, 5.5, 8.1, and 1.4 pounds. The six vegetarians gained 4.4, 5.1, -1.4, 0.9, 3.0, and 2.4 pounds. The four vegans gained 3.3, 0.4, 1.1, and 1.2 pounds.

a) How many degrees of freedom are there?

There are _____ - 1 = _____ degrees of freedom between the groups. There are _____ - 1 = _____ degrees of freedom for the non-vegetarians, _____ - 1 = _____ degrees of freedom for the vegetarians, and _____ - 1 = _____ degrees of freedom for the vegans, making a total of _____ + _____ + _____ = 13 degrees of freedom within the groups.

b) What is the critical value?

For $df_N = \underline{\hspace{2cm}}$ and $df_D = \underline{\hspace{2cm}}$ in the $\alpha = \underline{\hspace{2cm}}$ F table, $F_0 = \underline{\hspace{2cm}}$.

c) Calculate SS_W by hand.

Non-Vegetarians

x	$x - \bar{x}_1$	$(x - \bar{x}_1)^2$
8.6	3.1	9.61
6.4	0.9	0.81
3.0	-2.5	6.25
5.5	0.0	0.00
8.1	2.6	6.76
1.4	-4.1	16.81

$$\bar{x}_1 = 5.5 \quad \sum(x - \bar{x}_1)^2 = \underline{\hspace{2cm}}$$

$$SS_W = \sum \underline{\hspace{2cm}} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} = 73.28$$

Vegetarians

x	$x - \bar{x}_2$	$(x - \bar{x}_2)^2$
4.4	2.0	4.0
5.1	2.7	_____
-1.4	_____	_____
0.9	_____	_____
3.0	_____	_____
2.4	_____	_____

$$\bar{x}_2 = 2.4 \quad \sum(x - \bar{x}_2)^2 = 28.34$$

Vegans

x	$x - \bar{x}_3$	$(x - \bar{x}_3)^2$
3.3	_____	_____
0.4	_____	_____
1.1	_____	_____
1.2	_____	_____

$$\bar{x}_3 = 1.5 \quad \sum(x - \bar{x}_3)^2 = \underline{\hspace{2cm}}$$

d) Calculate MS_W by hand.

$$MS_W = \underline{\hspace{2cm}} = 5.64$$

e) Calculate SS_B by hand.

n_i	\bar{x}_i	$n_i \bar{x}_i$	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$	$n_i(x_i - \bar{x})^2$
6	5.5	33.0	2.16	4.67	28.02
6	2.4	14.4	_____	_____	_____
4	1.5	6.0	_____	_____	_____

$$\sum n_i = \underline{\hspace{2cm}} \quad \sum n_i \bar{x}_i = \underline{\hspace{2cm}}$$

$$SS_B = \sum n_i(x_i - \bar{x})^2 = 64.86$$

$$\bar{x} = \underline{\hspace{2cm}} = 3.338$$

f) Calculate MS_B by hand.

$$MS_B = \underline{\hspace{2cm}} = 23.42$$

g) Calculate F by hand.

$$F = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

h) State the conclusion, followed by $F_{df, df}$ and a range for p .

Non-vegetarian, vegetarian, and vegan women _____ during the first semester of college, $F_{\underline{\hspace{1cm}}, \underline{\hspace{1cm}}} = \underline{\hspace{2cm}}$, $p \underline{\hspace{1cm}} .05$.

i) Find the exact p value by doing a calculator test.

$$\text{For ANOVA}(\underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}), p = \underline{\hspace{2cm}}.$$