B. Using data from the previous page, calculate the following values.

$$SS_T = \Sigma[\frac{(\sum x_T)^2}{n}] - \frac{(\sum X)^2}{N}$$
$$= 733.564 - \frac{81.25^2}{9}$$
$$= 733.564 - 733.507$$
$$= .0570$$

$$SS_E = \Sigma x^2 - \Sigma[\frac{(\sum x_T)^2}{n}]$$
$$= 733.5725 - 733.5640$$
$$= .0085$$

$$SS_{TOTAL} = \Sigma x^2 - \frac{(\sum x)^2}{N}$$
$$= 733.5725 - 733.5070$$
$$= .0655$$

Note: Most of the variability (.0570 out of .0655) has been explained by the treatment variable.

C. Complete the following chart using the data accumulated to this point.

Variance Analysis Summary Table				
Variance Sources	df	Sum of the Squares	Mean Squares	ANOVA
Between Treatments	t - 1 = 3 - 1 = 2	$SS_T = .057$	$MS_T = \frac{SS_T}{t-1} = \frac{.057}{3-1} = .0285$	$F = \frac{MS_T}{MS_E} = \frac{.0285}{.0014} = 20.36$
Within Treatments (error)	N - t = 9 - 3 = 6	$SS_E = .0085$	$MS_E = \frac{SS_E}{N-t} = \frac{.0085}{9-3} = .0014$	
Total Variance	N - 1 = 9 - 1 = 8	$SS_{TOTAL} = .0655$		

D. Using the 5-step approach to hypothesis testing and the above chart, test at the .05 level whether the sample means are from populations with equal means.

1. These are the null hypothesis and alternate hypothesis.

$H_0 : \mu_1 = \mu_2 = \mu_3$ and $H_1 : \mu_1 \neq \mu_2 \neq \mu_3$

2. The level of significance for this one-tail problem is .05.
3. The test statistic is F.
4. If F from the test statistic is beyond the critical value for the .05 level of significance, the null hypothesis will be rejected.

df for the numerator is 2.
df for the denominator is 6.
F 's critical value is 5.14 (see Table 5B).

5. Apply the decision rule.

Reject H_0 because 20.36 > 5.14. These populations have different means.