

Name: \_\_\_\_\_

Suppose a researcher does a randomized experiment to compare the mean weight loss for three different programs for losing weight, and the observed weight loss (in lbs.) after three months are as follows:

Program 1	Program 2	Program 3
7	9	15
9	11	12
5	7	18
7		

The following statistics (in lbs.) are given for the data:

	sample size	mean	st. dev
Program 1	4	7	1.63
Program 2	3	9	2.00
Program 3	3	15	3.00
Total	10	10	4.06

1. Find  $SSTR (= \sum_{i=1}^r n_i(\bar{Y}_i - \bar{Y})^2)$  and  $SSE (= \sum_{i=1}^r (n_i - 1)s_i^2)$ .

$$SSTR = 4(7 - 10)^2 + 3(9 - 10)^2 + 3(15 - 10)^2 = 114$$

$$SSE = 3(1.63^2) + 2(2^2) + 2(3^2) = 34$$

$$SSTO = \sum_{i=1}^r \sum_{j=1}^{n_i} (Y_{ij} - \bar{Y}_{..})^2 = (n_T - 1) \frac{\sum_{i=1}^r \sum_{j=1}^{n_i} (Y_{ij} - \bar{Y}_{..})^2}{n_T - 1} = (n_T - 1)s^2 = 9(4.06^2) = 148$$

$$= SSTR + SSE$$

2. Complete the following table:

Source	SS	df	MS	F	p-val
Between	114	2	57	11.7	< 0.01
Error (Within)	34	7	4.85	X	X
Total	148	9	X	X	X