

Chapter 6 Problems

1.	Group	Subject	Y	\bar{Y}_A	$[Y - \bar{Y}_T] = [Y - \bar{Y}_A] + [\bar{Y}_A - \bar{Y}_T]$	$(Y - \bar{Y}_T)^2$	$(Y - \bar{Y}_A)^2$	$(\bar{Y}_A - \bar{Y}_T)^2$
	1	1	53	40	20	400	169	49
	1	2	49	40	16	256	81	49
	1	3	47	40	14	196	49	49
	1	4	42	40	9	81	4	49
	1	5	51	40	18	324	121	49
	1	6	34	40	1	1	36	49
	1	7	44	40	11	121	16	49
	1	8	38	40	15	225	64	49
	1	9	35	40	2	4	25	49
	1	10	18	40	-15	225	484	49
	1	11	32	40	-1	1	64	49
	1	12	27	40	-6	36	169	49
	2	13	47	26	14	196	441	49
	2	14	42	26	9	81	256	49
	2	15	39	26	6	36	169	49
	2	16	37	26	4	16	121	49
	2	17	42	26	9	81	256	49
	2	18	33	26	0	0	49	49
	2	19	13	26	-20	400	169	49
	2	20	16	26	-17	289	100	49
	2	21	16	26	-17	289	100	49
	2	22	10	26	-23	529	256	49
	2	23	11	26	-22	484	225	49
	2	24	6	26	-27	729	400	49
	SUM		792	792	0	0	0	5000 = 3824 + 1176
	MEAN		33.00	33.00	0.00	0.00	0.00	

sums of squares

$$2. a. \bar{Y}_A = \frac{\sum Y_A}{N_A} = \frac{258}{9} = 28.67$$

$$\bar{Y}_B = \frac{\sum Y_B}{N_B} = \frac{294}{9} = 32.67$$

$$\hat{\sigma}_A = \sqrt{SS_A/df_A} = \sqrt{[\sum Y_A^2 - (\sum Y_A)^2/N_A]/(N_A-1)} = \sqrt{(7472 - 258^2/9)/8} = 3.08$$

$$\hat{\sigma}_B = \sqrt{[\sum Y_B^2 - (\sum Y_B)^2/N_B]/(N_B-1)} = \sqrt{(9776 - 294^2/9)/8} = 4.64$$

$$b. [A] = \sum A^2/s = 153,000/9 = 17,000$$

$$[Y] = \sum Y^2 = 17,248$$

$$[T] = T^2/as = 552^2/(2 \cdot 9) = 16,928$$

$$c. SS_A = [A] - [T] = 17,000 - 16,928 = 72$$

$$SS_{S/A} = [Y] - [A] = 17,248 - 17,000 = 248$$

$$SS_T = [Y] - [T] = 17,248 - 16,928 = 320$$

$$d. df_A = a-1 = 1$$

$$MS_A = SS_A/df_A = 72/1 = 72.00$$

$$df_{S/A} = a(s-1) = 2 \cdot 8 = 16$$

$$MS_{S/A} = SS_{S/A}/df_{S/A} = 248/16 = 15.50$$

$$df_T = as-1 = 2 \cdot 9 - 1 = 17$$

e. Source	SS	df	MS	F
A	72.00	1	72.00	72.00/15.50 = 4.65
S/A	248.00	16	15.50	
T	320.00	17		