

Instructor's Manual for:
Introductory Statistics for the Behavioral Sciences, 7th Ed.
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Answers to All Exercises

Chapter 1

1. (a) $\sum X = 195$ $\sum X^2 = 2801$ $(\sum X)^2 = 38,025$
(b) $\sum X = 138$ $\sum X^2 = 1512$ $(\sum X)^2 = 19,044$
(c) $\sum X = 70$ $\sum X^2 = 550$ $(\sum X)^2 = 4,900$
(d) $\sum X = 55$ $\sum X^2 = 685$ $(\sum X)^2 = 3,025$
2. (a) $\sum X + \sum Y$ or $\sum(X + Y)$
(b) $\sum G + \sum P^2$ or $\sum(G + P^2)$
(c) $\sum X^2 - 6\sum XY + 4(\sum X)^2 + 2\sum Y^2$
3. (a) $\sum X = 10$ $(\sum X)^2 = 100$ $\sum(X + Y) = 40$
 $\sum Y = 30$ $(\sum Y)^2 = 900$ $\sum X - \sum Y = -20$
 $\sum X^2 = 30$ $\sum(X - Y) = -20$ $\sum XY = 73$
 $\sum Y^2 = 206$ $\sum X + \sum Y = 40$ $\sum X \sum Y = 300$
(b) Rule 1: $40 = 10 + 30$
Rule 2: $-20 = 10 - 30$
Rule 3: $73 \neq 300$
Rule 4: $30 \neq 100$; $206 \neq 900$
(c) $\sum(X + k) = 10 + 20 = 30$; $\sum X + k = 10 + 4 = 14$; Sum of new scores = 30
(d) $\sum(Y - k) = 30 - 15 = 15$; $\sum Y - k = 30 - 3 = 27$; Sum of new scores = 15

(e) $\sum(kX) = 2 * 10 = 20$; Sum of new scores = 20

4. **Data set 1:** $N = 5$

$$\sum X = 7; \sum X^2 = 15; (\sum X)^2 = 49; \sum XY = 23; \sum(X + Y) = 18;$$

$$\sum Y = 11; \sum Y^2 = 39; (\sum Y)^2 = 121; \sum X \sum Y = 77; \sum(X - Y) = -4;$$

$$\sum(X * 3.2) = 7 * 3.2 = 22.4; \sum(Y - 7) = 11 - 5(7) = -24;$$

$$\sum(X + 1.8) = 7 + 5(1.8) = 16; \sum(Y / 4) = 11 / 4 = 2.75$$

Data set 2: $N = 8$

$$\sum X = 36.39; \sum X^2 = 253.04; (\sum X)^2 = 1324.23; \sum XY = 86.2; \sum(X + Y) = 56.46;$$

$$\sum Y = 20.07; \sum Y^2 = 76.74; (\sum Y)^2 = 402.80; \sum X \sum Y = 730.35; \sum(X - Y) = 16.32;$$

$$\sum(X * 3.2) = 36.39 * 3.2 = 116.45; \sum(Y - 7) = 20.07 - 8(7) = -35.93;$$

$$\sum(X + 1.8) = 36.39 + 8(1.8) = 50.79; \sum(Y / 4) = 20.07 / 4 = 5.02$$

5. **Data set 3:** $N = 14$

$$\sum X = 1,176; \sum X^2 = 100,288; (\sum X)^2 = 1,382,976; \sum XY = 96,426; \sum(X + Y) = 2,305$$

$$\sum Y = 1,129; \sum Y^2 = 93,343; (\sum Y)^2 = 1,274,641; \sum X \sum Y = 1,327,704; \sum(X - Y) = 47$$

Chapter 2

1.

Score	Turck		Kirk		Dupre	
	<i>f</i>	<i>cf</i>	<i>f</i>	<i>cf</i>	<i>f</i>	<i>cf</i>
20	1	15	0	15		
19	0	14	0	15		
18	1	14	0	15		
17	2	13	1	15		
16	1	11	0	14		
15	1	10	0	14		
14	1	9	1	14		
13	2	8	0	13		
12	0	6	3	13		
11	2	6	2	10	1	10
10	1	4	0	8	1	9
9	1	3	1	8	2	8
8	0	2	2	7	0	6
7	0	2	2	5	1	6
6	1	2	1	3	1	5
5	1	1	0	2	2	4
4			0	2	2	2
3			1	2	0	0
2			0	1	0	0
1			1	1	0	0

2.

Score	Turck		Kirk	
	<i>f</i>	<i>cf</i>	<i>f</i>	<i>cf</i>
19–20	1	15	0	15
17–18	3	14	1	15
15–16	2	11	0	14
13–14	3	9	1	14
11–12	2	6	5	13
9–10	2	4	1	8
7–8	0	2	4	7
5–6	2	2	1	3
3–4	0	0	1	2
1–2	0	0	1	1

3. The Histogram is approximately symmetrical, and bimodal in shape.

4. The Turck polygon skews to the left, the Kirk polygon skews to the right, and both appear bimodal.

5.

Stems (Intervals)	Leaves (Observations)
3 – 5	5
6 – 8	6
9 – 11	9 0 1 1
12 – 14	3 3 4
15 – 17	5 6 7 7
18 – 20	8 0

6. (1): b (4): b
 (2): a (5): d
 (3): a (6): g

7. (a) The *cf* corresponding to a score of 8 is 2; $PR = (2/15) \times 100 = 13.33\%$, so the PR for 8 is about 13.
 (b) The *cf* for a score of 12 is 6; $PR = (6/15) \times 100 = 40\%$, so the PR for 12 is 40.

8. (a) A score of 16 corresponds to a *cf* of 14; $PR = 14/15 \times 100 = 93.33$.
 (b) A score of 7 corresponds to a *cf* of about 4; $PR \sim 4/15 \times 100 \sim 27$.

9. (a) The desired *cf* = $(25/100) \times 15 = 3.75$, so the score at the 25th percentile is about 10.
 (b) The desired *cf* = $(75/100) \times 15 = 11.25$, so the score at the 75th percentile is about 16.

10. (a) The 2nd decile at Kirk Hall corresponds to a *cf* of $.2 \times 15 = 3$, which corresponds to a score of 6.5 (i.e., the upper real limit of the 5–6 interval).
 (b) The 50th percentile corresponds to a *cf* of $.5 \times 15 = 7.5$, which corresponds to a score of 9.5 (i.e., midway through the 9–10 interval).
 (c) The 68th percentile corresponds to a *cf* of $.68 \times 15 = 10$, which corresponds to a score of about 11.