

Chapter 8 Exercise Set A

1

a) 59" ; 65"

b) 75" ; 69"

c) 76" - 64"

d) 2

e) 68"

f) Range was $60 - 76 = 16 / 4 = 4$ that's close to 3

2

x	y
1	4
2	3
3	1
4	1
4	2

3a

2 points on 1, 2 points on 2 $\frac{1+1+2+2}{4} = 1.5$

3b

Range 1-2 is too small. $2-1 = 1/4 = .25$ I'll guess .5 because .1

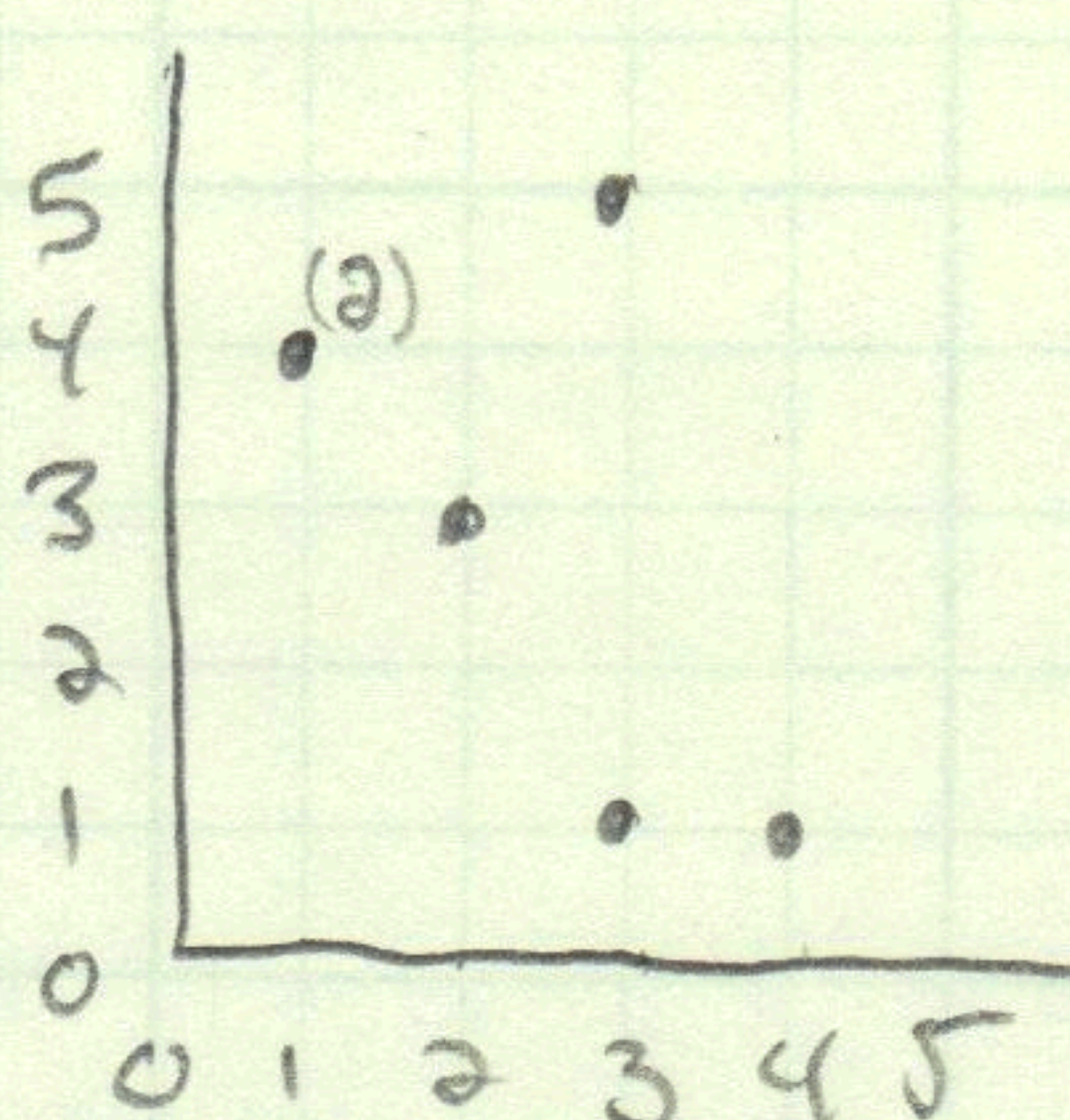
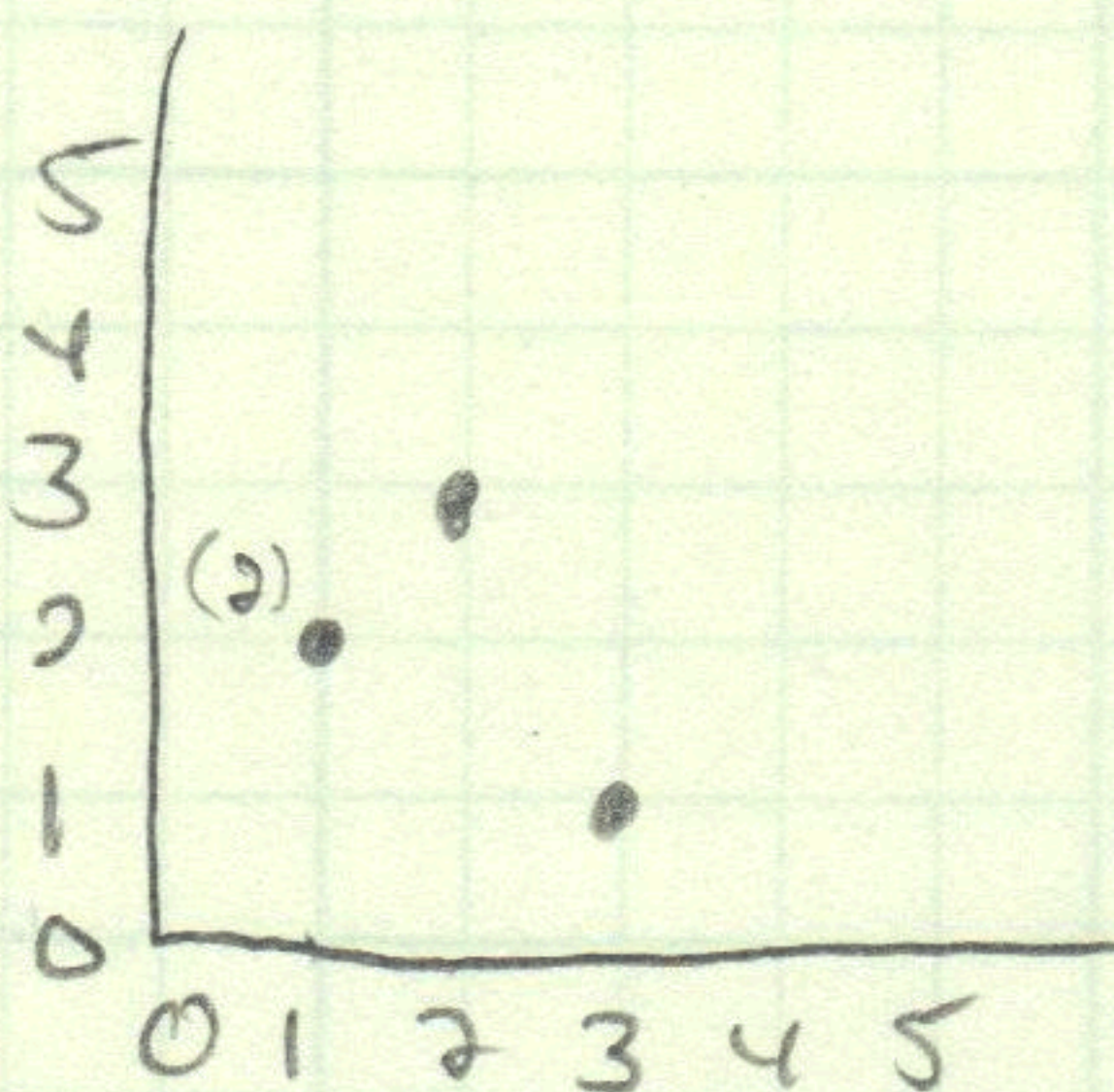
3c

$\frac{1+3+4}{3} = \frac{8}{3}$ about 2

3d

Range 1-4 is too small. $4-1 = 3/4 = .75$ I'll guess 1.5 because .5

4



5

a) $F \rightarrow A \rightarrow B$

b) G, H, C

c) 50

d) Range $100 - 10 = 90 / 4 \approx 25$

e) 30

f) False they did not do well on the final

g) False it is a negative association

6

a) 75

b) Range 55 - 100

$45/4 \approx 11$ so 10

c) Range 10 - 100

$90/4 \approx 20$

d) Final - it had a greater range.

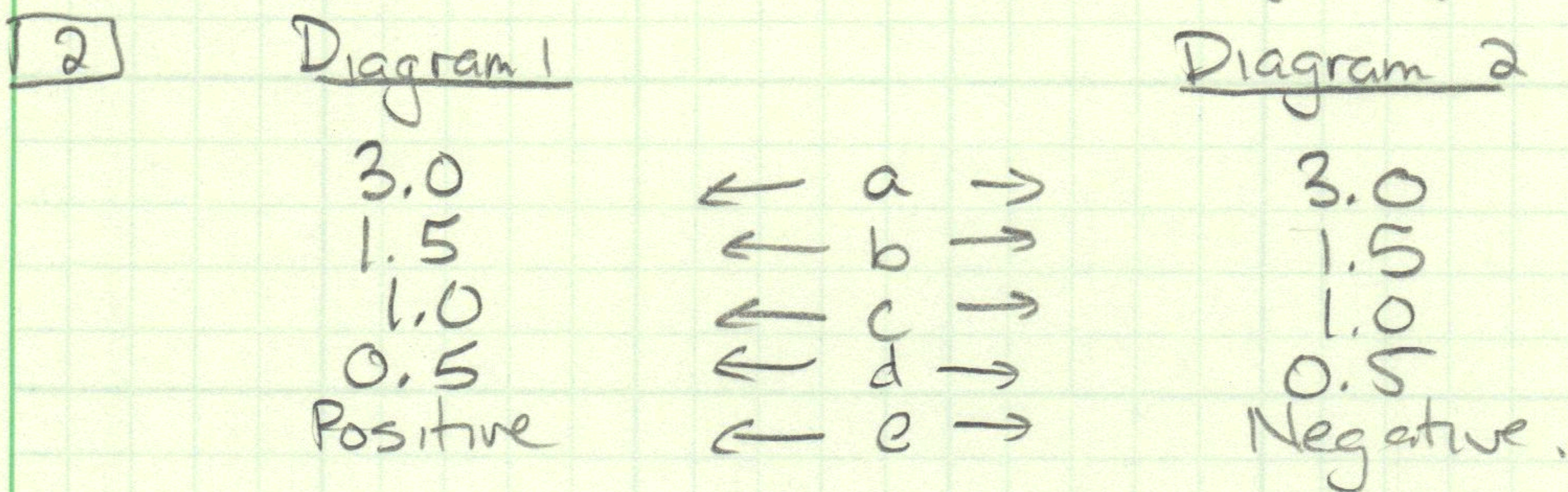
e) Final

f) True.

Chapter 8 Exercise Set B

1a) Negative because as a car gets older its price goes downward.

1b) Negative. The lighter the car the more mpg it gets, the heavier it is the less mpg it gets.



c) Range 1-5 $5-1=4/4=1$

d) Range .5-2.5 $2.5-.5=2/4=.5$

3) Diagram 1 has a bit fatter spread which makes the correlation coefficient closer to 0. Diagram 2 has a stronger linear relationship so it is closer to 1.

4) I'm guessing .5 because it's still fairly circular.

5) $b' = 70''$ r would be 0, it looks random.

6) a) exactly 1, for any man's age the wife is five years younger; as men age so do wife's ages.

b) close to 1, women tend to marry men who are older than them but not too much older.

7) a) 1, this is an exact relationship.

b) Somewhat positive; women have children in a certain range and will be older than their children.

8) a) somewhat positive. The wife's income will increase the family income but women tend to make less than men with a lot of variability.

b) nearly -1 because the more the woman makes the less the man does in that range.

9) False. All r tells us is how linearly associated the points are. Not a %age of associated points.

Chapter 8 Exercise Set C

- 1) a) True
b) False

2) Dashed - it goes through the center of the cloud.

3) 72 inches is 1 SD from average because
$$\frac{72-69}{3} = 1$$

If the person is 1 SD above average in height and on the SD line, then he is 4 SD above average in height.

$$\frac{x-140}{20} = 1 \Rightarrow x = 1(20) + 140 = 160 \text{ lbs.}$$

4a) 75 inches is 2 SD's above average

$$\frac{75-69}{3} = 2 \quad \text{applying same logic.}$$

$$\frac{x-140}{20} = 2 \Rightarrow x = 2(20) + 140 = 180 \text{ lbs. } \underline{\text{Yes!}}$$

4b) 66 inches is 1 SD below average.

$$\frac{66-69}{3} = -1$$

$$\frac{x-140}{20} = -1 \Rightarrow x = -1(20) + 140 = 120 \text{ lbs. } \underline{\text{No}}$$

4c) Yes! work in 4b.

Chapter 8 Exercise Set D

1a

X	Y	$x \Rightarrow SU$	$y \Rightarrow SU$	product
1	6	-1.5	1.0	-1.5
2	7	-1.0	1.5	-1.5
3	5	-.5	.5	-.25
4	4	0	0	0
5	3	.5	-.5	-.25
6	1	1.0	-1.5	-1.5
7	2	1.5	-1.0	-1.5

average of product = $r \approx .9386$

$X \leftrightarrow Y$ ave = 4
SD of $X \leftrightarrow Y = 2$

1b

X	Y	$x \Rightarrow SU$	$y \Rightarrow SU$	product
1	2	-1.5	-1.0	1.5
2	1	-1.0	-1.5	1.5
3	4	-.5	0	0
4	3	0	-.5	0
5	7	.5	1.5	.75
6	5	1.0	.5	.5
7	6	1.5	1.0	1.5

average of product = $r \approx .82$

1c

X	Y
1	7
2	6
3	5
4	4
5	3
6	2
7	1

There is a pattern! This forms a line! The line slopes down. If all points are on a line the $r = 1$ or -1

Sloping down $r = -1$

2 50% (Upper Right Quadrant)

3 25% (Upper Right Quadrant)

4 5% (Negative correlation)

Chapter 8 Review Exercises

1

d is the correct one.

a isn't centered around the point of averages.

b the SD's are too small.

c the correlation is too high

2a

Negative, as cars age the gas mileage goes down due to wear and tear.

2b

People with high incomes are probably those who have to commute long distances to work so they buy cars that get better gasoline economy. Rich people also buy new cars which usually have better gas mileage.

3

Since they are stating a rule then everyone would be on the line this creates. (It does form a line) So the correlation is 1. (As men grow, the wife's get taller too)

4

.3, women usually marry taller men but there is still a lot of variability.

5

i) .60 If you do well in Freshman year you probably will do well the next year. There is still some variability but it's not too significant.

ii) .30 Students final GPA's are usually very different between these two years. Lots of variability.

iii) .95 You would hope that the weight of wood be consistent if the length is, but there is a very slight variability.

6

False! The Final & Midterms were closely associated but not necessarily twice as much, we'd have to look at the individual data. r measures association! Can you be twice as associated to something?

7

.62 -1.00

-.85 .97

0.06 -.38

8

a) about 42 in.

b) Range 66-76. $76-66/4 = 2.5$

c) .8

d) Solid. (Center of cloud)

9a

x	y	x \Rightarrow SU	y \Rightarrow SU	product
1	5	-1	1	-1
1	3	-1	0	0
1	5	-1	1	-1
1	7	-1	2	-2
2	3	0	0	0
2	3	0	0	0
2	1	0	-1	0
3	1	1	-1	-1
3	1	1	-1	-1
4	1	2	-1	-2

ave: 2
SD: 1

ave: 3
SD: 2

Average of product = $r \approx -.80$

9b

x	y	x \Rightarrow SU	y \Rightarrow SU	product
1	1	-1	-1	1
1	2	-1	0	0
1	1	-1	-1	1
1	3	-1	1	-1
2	1	0	-1	0
2	4	0	2	0
2	1	0	-1	0
2	2	1	0	0
3	2	1	0	0
4	3	2	1	2

ave: 2
SD: 1

ave: 2
SD: 1

Average of product = $r \approx .30$

9e	X	Y	X ⇒ SU	Y ⇒ SU	product
	1	2	-1	-1	1
	1	2	-1	-1	1
	1	2	-1	-1	1
	1	2	-1	-1	1
	2	5	1	1	1
	2	5	1	1	1
	2	5	1	1	1
	2	6	0	0	0
	3	6	0	0	0
	3	6	0	0	0
	3	6	0	0	0
	4	8	1	1	1
	4	8	1	1	1
	4	8	1	1	1
	4	8	1	1	1

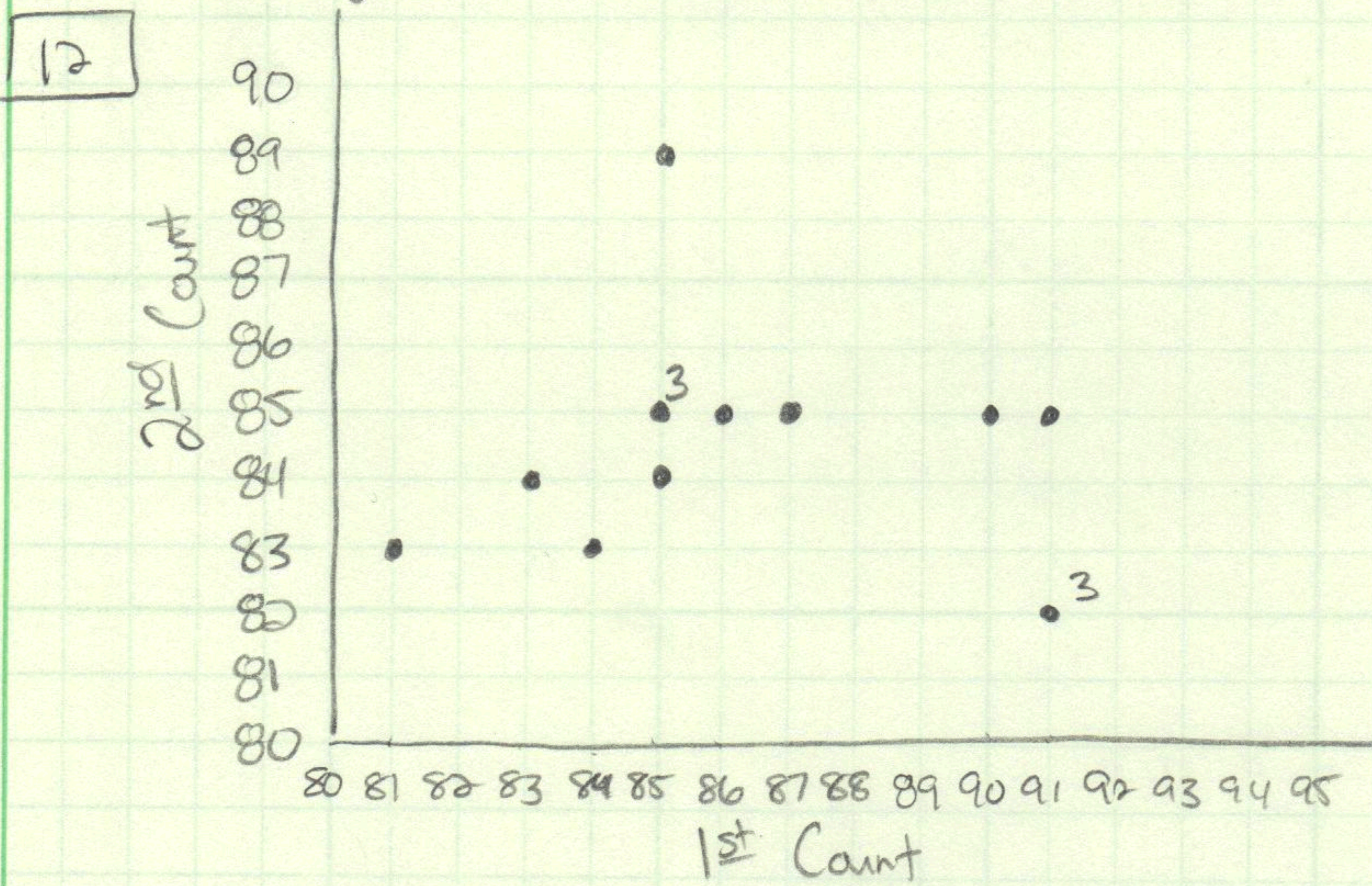
ave: 2
SD: 1

ave: 4
SD: 2

average of products = $r \approx 1.00$

10 75 because the spread is less there.

11 1.00 because if you get 5 wrong you have to get 5 right. This data is on a line.



a) The 3 students who got 92 then 82 probably worked together because these answers are so off. The 3 students who got 85 and the 85 could work independently and be good counters since 85 is the right answer.

b) False, the upper right corner is empty.