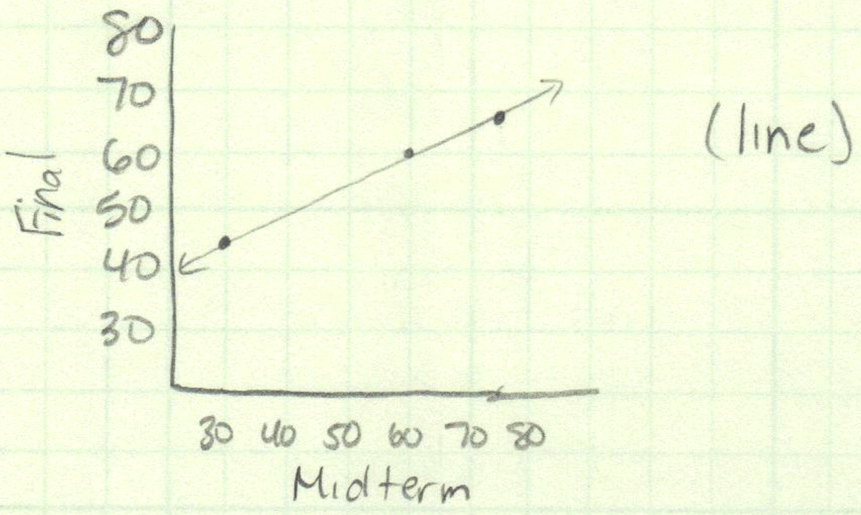
Chapter 10 Exercise Set A

1a 75 is one SD above ave. $1SD \times .5 = .5$ so the final score will be .5 SD's above ave. or $15/2 = 7.5 + 60 = \underline{67.5}$

1b 30 is 2 SD's below ave $-2SD \times .5 = -1$ so the final score will be 1 SD below ave or $-15 + 60 = \underline{45}$

1c 60 is no SD's above/below ave $0SD \times .5 = 0$ so the final score will be 0 SD's above/below ave or $\underline{60}$



2a 69" is zero SD's above/below ave 0 SD's $\times .41 = 0$ so the weight will be 0 SD's above/below ave or 190 lbs.

2b 66" is 1 SD below ave -1 SD's $\times .41 = -.41$ so the weight will be .41 SD's below ave or $-.42 \times .41 = -17.22 + 190 = 172.78$ lbs

2c 24" is $\frac{24-69}{3} = 15$ SD's below ave -15 SD's $\times .41 = -6.15$ so the weight will be 6.15 SD's below ave or $-6.15 \times 42 = -258.3 + 190 = -68.3$ lbs

2d 0" is 23 SD's below ave -23 SD's $\times .41 = -9.43$ so the weight will be 9.43 SD's below ave or $-9.43 \times 42 = -396.06 + 190 = 206.06$.

c and d are ridiculous! How many 18+ year olds are 2 ft tall or 0" tall? When we are this far from average we should NOT estimate.

3 False. The variability is probably different than the overall variability so we can't conclude that they are the same.

4 12 years is $\frac{12-14}{2.4} = -.83$ SD's below ave. $-.83 \times .34 = -.283$ so the income will be $-.283$ SD's below ave or $-.283 \times 26000 = -7366.67$
$-7366.67 + 32000 = 2,463.33$.

5 Because the correlation is negative if x increases then y must decrease and vice versa.

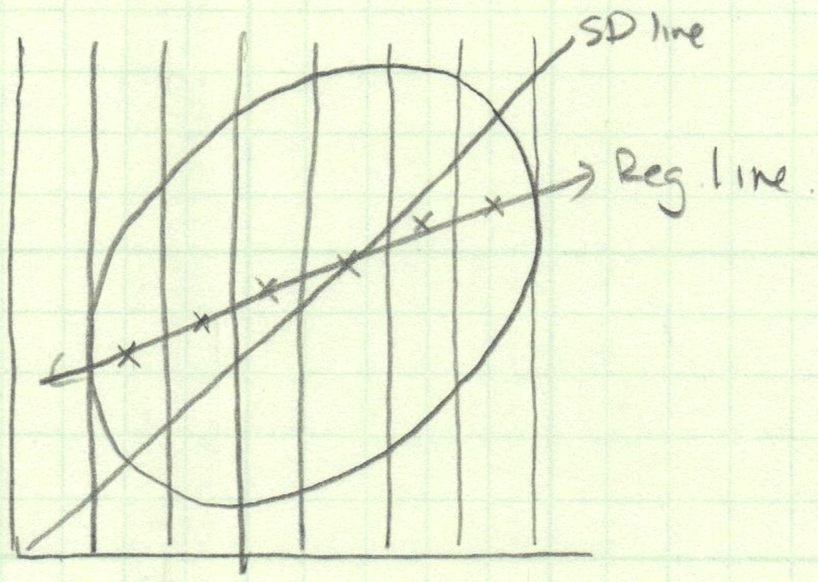
Chapter 10 Exercise Set B

1a True. Men typically make more than women based on job choice.

1b Maybe not many wives work when their husbands make so much, it is an outlier. Chance Error.

1c Little too low, the points are above the line.

2



3

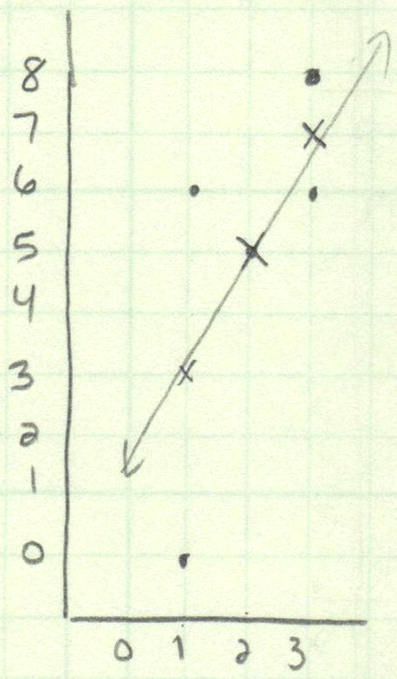
Solid - regression
Dashed - SD

Solid - SD
Dashed - Regression

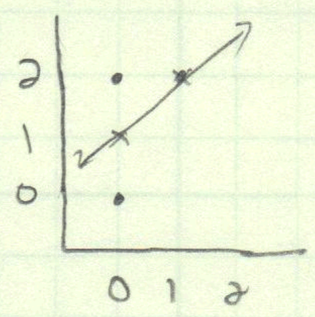
Solid - Regression
Dashed - SD

Solid - SD
Dashed - Regression

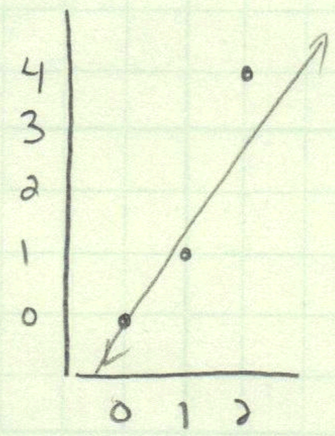
4a



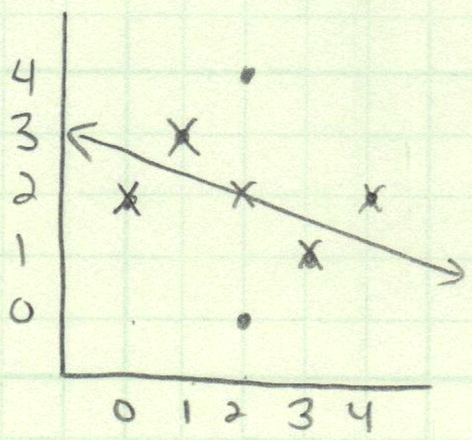
4b



4c



4d



Chapter 5 Exercise Set C

1a ① $\frac{75-60}{15} = 1$

② $1 \times .5 = .5$

③ $X = .5(15) + 60 = \underline{67.5}$

1b ① $\frac{30-60}{15} = -2$

② $-2 \times .5 = -1$

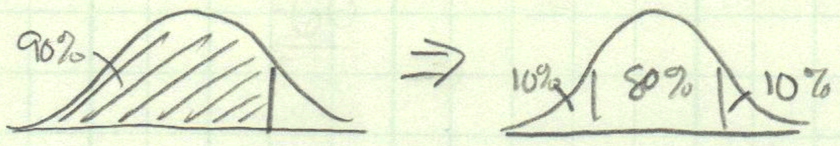
③ $x = -1(15) + 60 = 45$

1c ① $\frac{60-60}{15} = 0$

② $0 \times .5 = 0$

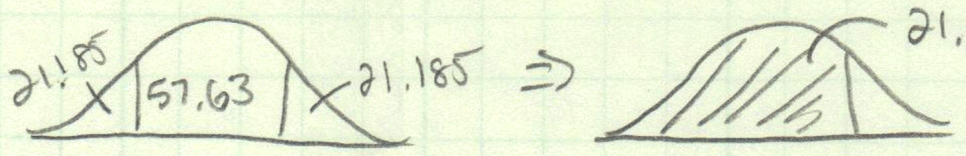
③ $x = 0(15) + 60 = 60$

1d 60 the overall average.

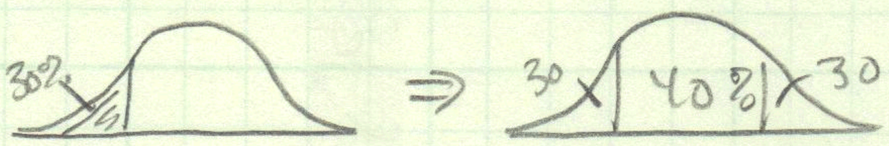
2a 

80% ≈ 1.3

$1.3 \times .60 = .78 \approx .80 \approx 57.63\%$

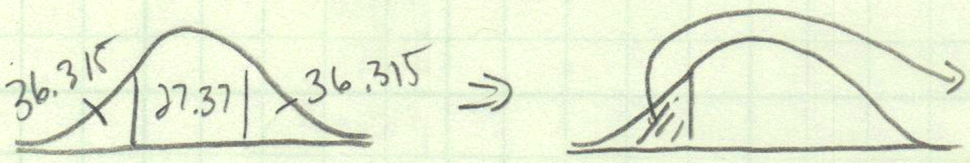


= 78.815%ile.

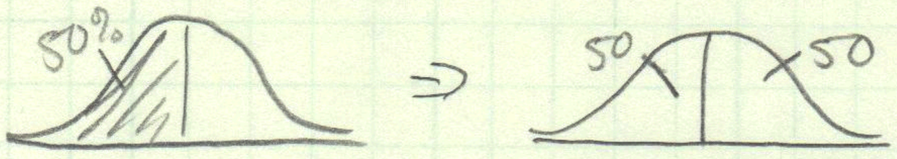
2b 

40% ≈ .55

$.55 \times .60 = .33 \approx .35 \approx 27.37\%$



36.315%ile

2c 

0% ≈ 0

$0 \times .60 = 0 \approx 0\%$ so $\underline{50\%ile}$

2d Expect ave or in percentile for normal distribution 50%ile

3a Dashed same %ile rank ($x=y$ in this case)

3b Solid. It is the regression line for predicting y from x.

4 a) People don't usually marry before 20.

b) Ages are discrete in this case. so there can't be 40.5 and 35.5 as a point.

Chapter 10 Exercise Set D

1. No, this was an example of the regression effect. Blaming this effect on anything but itself is the regression fallacy.

2. No. We would expect them to get closer to 50 but not surpass it using the regression effect. The tutoring must have helped.

3. Yes. Chance Error explains this difference.

Chapter 10 Exercise Set E

1. False. There are two regression lines given height predict weight and given weight predict height. Different lines give different results.

2. False. You have to use the other line.

3. False, The method of Regression is NOT bidirectional.

Chapter 10 Review Exercises

1 i) A
ii) C
iii) B
iv) Not Matched with any.

2a 115 is one SD above ave $1SD \times .80 = .80$ so the 35 yr old score will be .80 SD's above average or $15 \times .80 = 12 + 100 = 112$

2b ① $\frac{115-100}{15} = 1$

② $1 \times .80 = .80$

③ $X = .8(15) + 100 = 112$

3a ① $\frac{72-68}{2.7} = 1.48$

② $1.48 \times .25 = .37$

③ $X = .37(2.5) + 63 \approx \underline{64"}$

3b ① $\frac{64-68}{2.7} = -1.48$

② $-1.48 \times .25 = -.37$

③ $X = -.37(2.5) + 63 \approx 62"$

3c ① $\frac{68-68}{2.7} = 0$

② $0 \times .25 = 0$

③ $X = 0(2.5) + 63 = 63"$

3d 63" ave of women.

4a ① $\frac{18-12}{3} = 2$

② $2 \times .5 = 1$

③ $X = (1)(3) + 12 = 15$

4b ① $\frac{15-12}{3} = 1$

② $1 \times .5 = .5$

③ $x = .5(3) + 12 = 13.5$

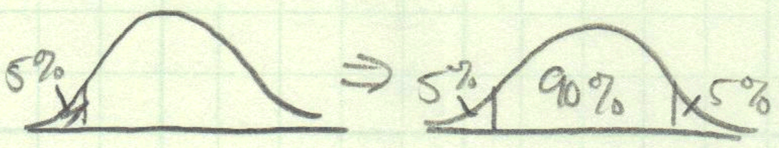
4c What is happening here is the regression effect, nothing more.

5 a) False, This is a misuse of r (Ch. 8)
b) False, Association is not causation.
c) True
d) True
e) False. Association is not causation

6 Solid - Regression for y on x
Dashed - Regression for x on y } prediction line falls.
Dotted - SD (center of 3)

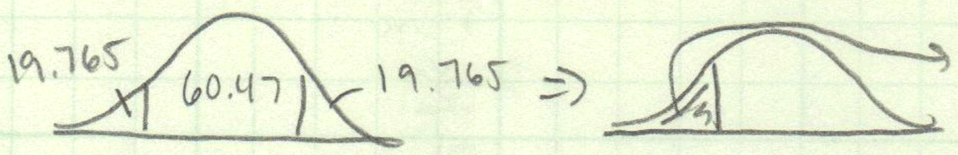
7 Neither. This is the regression effect. Blaming it on anything else would be the regression fallacy.

8 The regression effect won't say anything because it looks like <u>everyone's</u> blood pressure went down, even those who were low to begin with. They must be relaxed.

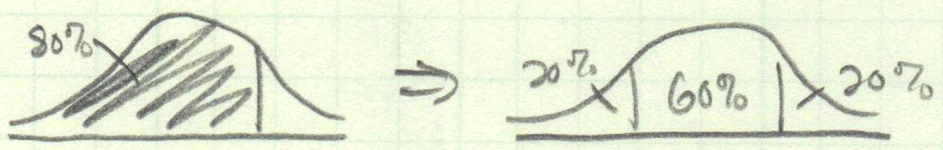
9a 

90% ≈ 1.65

$1.65 \times .5 = .825 \approx .85 \approx 60.47\%$

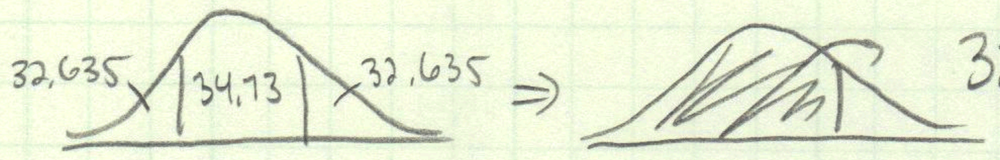


19.765%ile

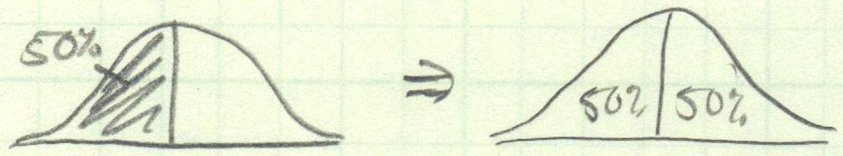
9b 

60% ≈ .85

$.85 \times .5 = .425 \approx .45 \approx 34.73\%$

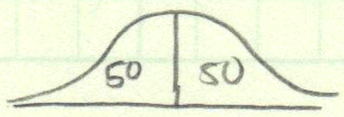


32.635 + 34.73 = 67.365%ile.

9c 

0% ≈ 0

$0 \times .5 = 0 = 0\%$



50%ile

9d 50% the average for normal curve

10 False. The regression method is still influenced by the regression effect.. There are also 2 lines, this makes it sound as if there is one