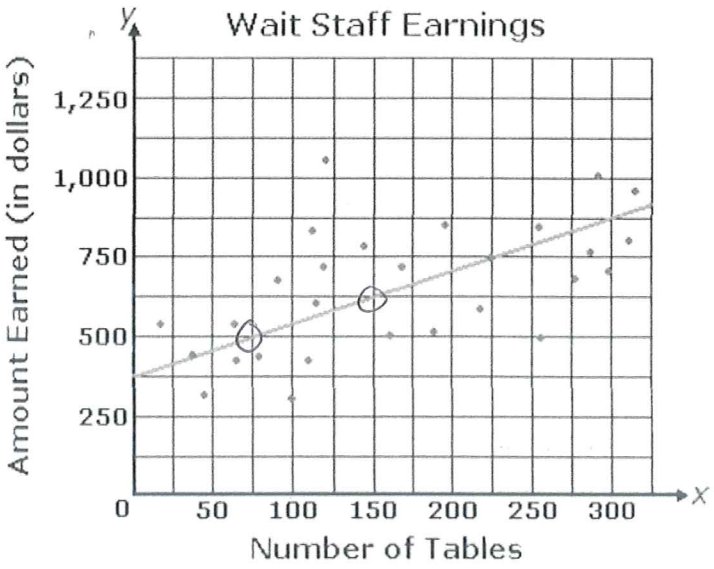
Name Key Period _____ Date _____

More Inv. 4 and 5 Practice

1. The graph below shows a line of best fit for data collected on the amount earned by servers last week in relation to the number of tables they served.



a. Write the equation for the line of best fit.

(75, 500) (150, 625) +75 +125

$\frac{\Delta y}{\Delta x} = \frac{125}{75} = \frac{5}{3}$

$y = mx + b$

$y = \frac{5}{3}x + b$

$500 = \frac{5}{3}(75) + b$

$500 = 125 + b$

$-125 \quad -125$

$375 = b$

$y = \frac{5}{3}x + 375$

b. What does the value of the slope represent in the context of this problem?

Slope $= \frac{5}{3}$

For every 3 tables served she makes an additional $5

OR

Slope $= \frac{5}{3} = 1.67$

For every table she serves she makes an additional $1.67

c. What does the value of the y-int represent in the context of this problem?

y-int = 375 Her base salary is $275/week

d. Using your model calculate how many tables a server would need to serve to make $1000 in a week.

$y = \frac{5}{3}x + 375$

$1000 = \frac{5}{3}x + 375$

$-375 \quad -375$

$625 = \frac{5}{3}x$

$3(625) = \left(\frac{5}{3}x\right)3$

$\frac{1875}{5} = \frac{5x}{5}$

$375 = x$

She would need to serve 375 tables per week.

e. Use your model to determine how much money would a server make if he was only able to serve 105 tables in the week?

$y = \frac{5}{3}x + 375$

$y = \frac{5}{3}(105) + 375$

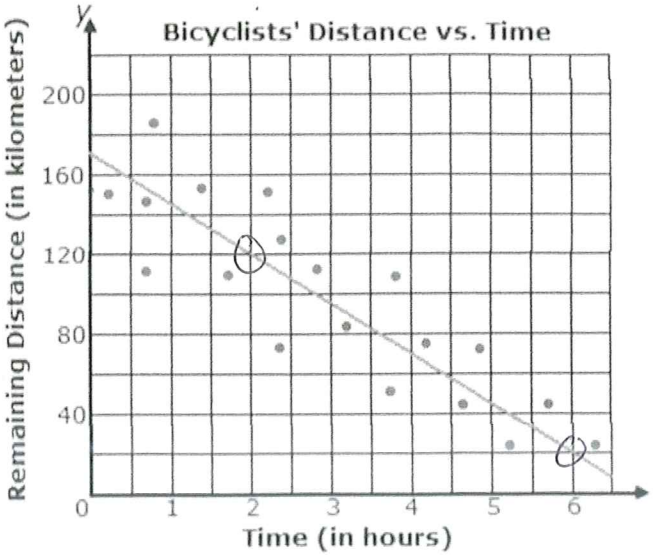
$y = 175 + 375$

$y = 550$

If he only served 105 tables in the week he would make $550.

2. The graph below shows a line of best fit for data collected on the distance bicyclists in a race have remaining in relation to the amount of time they have been riding.

a. Write the equation for the line of best fit.



$+4 < \begin{matrix} 2, 120 \\ 6, 20 \end{matrix} > -100$

$\frac{\Delta y}{\Delta x} = \frac{-100}{4} = -25$

$y = mx + b$

$y = -25x + b$

$120 = -25(2) + b$

$120 = -50 + b$

$+50 \quad +50$

$170 = b$

$\boxed{y = -25x + 170}$

b. What does the value of the slope represent in the context of this problem?

slope = -25 For every hour riding, the cyclist reduces the remaining distance by 25 kilometers.

c. What does the value of the y-intercept represent in the context of this problem?

y-int = 170 It is 170 km from start to finish for the race.

d. Using your model calculate how many kilometers the cyclist has remaining if she has been riding for three hours and forty-five minutes.

3 hours 45 minutes = 3.75 hr.

$y = -25x + 170$

$y = -25(3.75) + 170$

$y = -93.75 + 170$

$y = 76.25$

After riding for 3.75 hrs. the cyclist will have 76.25 km left to go.

e. Use your model to determine if the cyclist is 50 kilometers from the finish, how long has she been riding?

$y = -25x + 170$

$50 = -25x + 170$

$-170 \quad -170$

$\frac{-120}{-25} = \frac{-25x}{-25}$

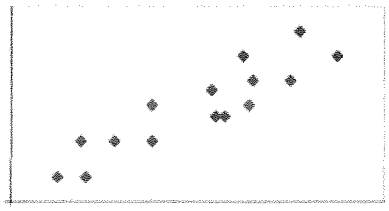
$x = 4.8$

She has been riding for 4.8 hours, or 4 hours 48 minutes

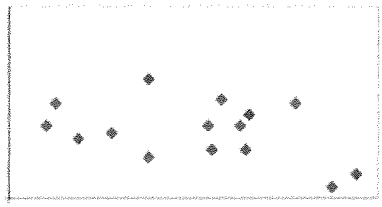
3. Match each scatterplot with the correct correlation coefficient and fill in the table below

Correlation Coefficient	-0.85	-0.50	0	0.40	0.90	0.99
Scatterplot	d	b	f	e	a	c

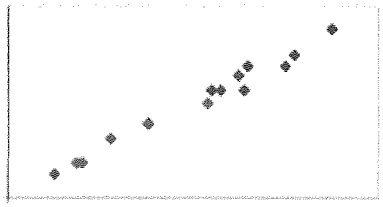
a.



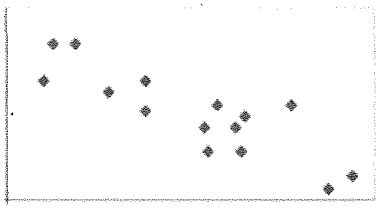
b.



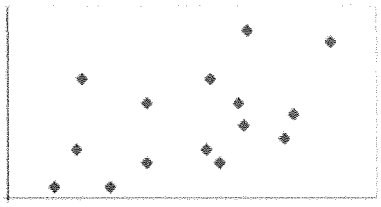
c.



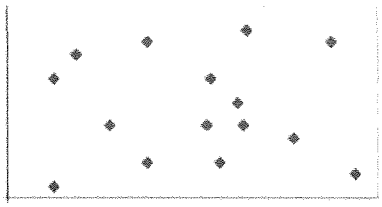
d.



e.



f.



4. List the correlation coefficients in order from least to greatest strength:

0.79 -0.43 -0.4 0.82 0.51 0.08

0.08, -0.4, -0.43, 0.51, 0.79, 0.82

Remember +/- has nothing to do with how strong a relationship is.

5. The table to the right gives information about numbers of students who do and don't do chores and do and don't collect allowance.

	Allowance	No Allowance	
Do Chores	13	3	16
Do Not Do Chores	5	4	9
	18	7	

Are students who do not collect allowance more likely to not do chores?

Yes chores: $\frac{3}{7}$

No chores: $\frac{4}{7}$

Yes, they are likely to NOT do chores $\frac{4}{7} > \frac{3}{7}$

Is it more likely for a student who does not do chores to collect allowance than it is for a student who does chores to not get an allowance?

No chores, collects $: $\frac{5}{9} = 0.56$

Yes chores, no $: $\frac{3}{16} = 0.19$

Yes, it is more likely for a student who doesn't do chores to collect an allowance than to have a student who does chores not get an allowance.

6. The two-way table below shows the number of students with each hair color and eye color.

		Hair Color				
		Black	Brown	Red	Blond	Total
Eye Color	Brown	7	12	3	1	23
	Blue	2	8	2	9	21
	Hazel	2	5	1	1	9
	Green	1	3	1	2	7
	Total	12	28	7	13	60

True or false? Provide data to support your claim.

a. Blonde students are more likely to have blue eyes than brown haired students.

TRUE

Blonde w/ blue eyes : $\frac{9}{13} = 0.69$

Brown w/ blue eyes = $\frac{8}{28} = 0.29$

$0.69 > 0.29$

b. Green eyed students are as likely to have brown hair as brown eyed students are to have red hair.

FALSE

Green eyes w/ brown hair : $\frac{3}{7} = 0.43$

Brown eyes w/ red hair : $\frac{3}{23} = 0.13$

$0.43 \neq 0.13$ * Way more likely for Green eyed students to have brown hair *

c. Students are four times as likely to have brown hair as they are to have red hair.

TRUE

Total Brown = 28

Total Red = 7

$\frac{28}{7} = 4$

d. Blonde haired students are much more likely to have light eyes (blue, hazel, green) than red haired students.

TRUE

Blonde w/ light eyes: $\frac{9+1+2}{13} = \frac{12}{13} = 0.92$

Red w/ light eyes: $\frac{2+1+1}{7} = \frac{4}{7} = 0.57$

$0.92 > 0.57$

e. Red haired students are less likely to have blue eyes than brown haired students.

FALSE

Red w/ blue eyes : $\frac{3}{7} = 0.43$

Brown w/ blue eyes : $\frac{12}{28} = 0.43$

$0.43 = 0.43$

7. 80 students each study one science. The table below gives some information about these students. Complete the table, and then using the data answer the following questions.

	Biology	Chemistry	Physics	Total
Female	18	15	14	47
Male	8	6	19	33
Total	26	21	33	80

True or False? Provide data to support your claim.

a. Women are three times as likely to study Biology as men are to study Chemistry.

FALSE

Women - Bio : $\frac{18}{47} = 0.38$

Men - Chem : $\frac{6}{33} = 0.18$

$\frac{0.38}{0.18} = 2.1$

b. Two and a half times as many women study Chemistry as men.

TRUE

# of women in Chemistry = 15

# of men in Chemistry = 6

$\frac{15}{6} = 2.5$

c. Men are almost twice as likely as women to study Physics.

TRUE

Men - Physics : $\frac{19}{33} = 0.58$

Women - Physics : $\frac{14}{47} = 0.30$

$\frac{0.58}{0.30} = 1.9$