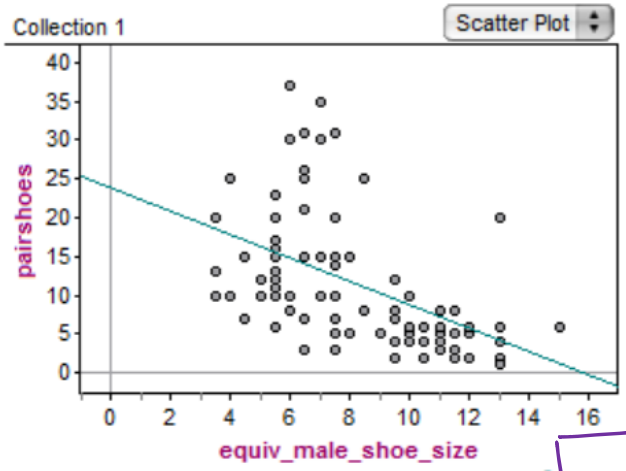
Ch 07-08 Practice WS

Name: _____

Per: _____

1. Given the scatterplot and summary statistics provided answer the following questions.



Collection 1

	equiv_male_shoe_size	pairshoes
	8.30526	11.0105
	2.8287	8.31877

S1 = mean ( )
S2 = stdDev ( )

$r^2 = 0.27 \rightarrow r = -0.5196$

pairs of shoes = 23.7 − 1.528 (shoe size)

a. Calculate the line of best fit.

$b = (-.5196)\left(\frac{8.31877}{2.8287}\right) = -1.528$

$11.0105 = -1.528(8.30526) + b_0$

$b_0 = 23.7$

b. Interpret what the slope means in context (verbatim sentence).

The number of pairs of shoes owned is predicted to decrease by 1.528 pairs of shoes for each additional shoe size.

c. Interpret what the y-intercept means in context (verbatim sentence).

If a person has a shoe size of 0, they are predicted to own approximately 24 pairs of shoes.

d. What is r equal to? What does this tell you about the relationship between shoe size and pairs of shoes owned?

The correlation coefficient is -0.5196, showing a moderate, negative linear relationship between shoe size and number of pairs of shoes owned.

e. Interpret r^2 in the context of the problem (verbatim sentence).

27% of the variation in the number of pairs of shoes owned can be accounted for by the linear model relating shoe size and pairs of shoes owned.

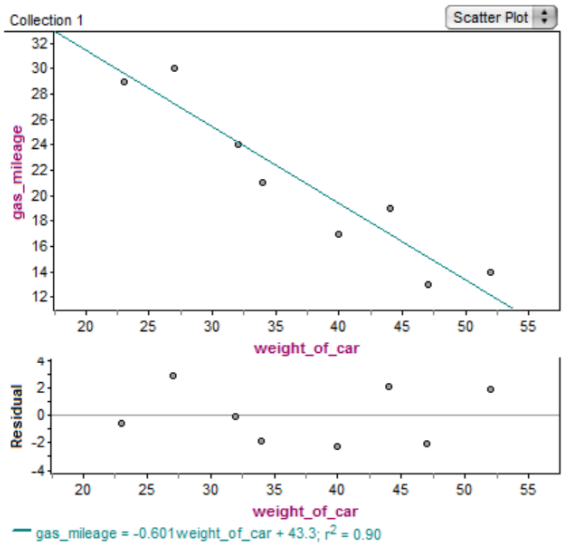
f. What is the predicted number of shoes owned if your shoe size is 8.5?

pairs of shoes = 23.7 − 1.528 (8.5)

= 10.7

≈ 11 pairs of shoes

2. Do heavier cars really use more gasoline? In the following data set, x is the weight of some randomly selected cars (in hundred of pounds), and y is the gas mileage (in mpg) for that car (Consumer Reports, vol. 62, no. 4).



a. What is the residual for point (34, 21)?

$\widehat{gas\ mileage} = -0.601(34) + 43.3$

$= 22.866$

residual = actual − predicted

$= 21 - 22.866$

$\boxed{resid = -1.866}$

b. If a car weighs 30,000 pounds, what is its predicted mpg?

$\widehat{gas\ mileage} = -.601(30) + 43.3$

$= \boxed{25.27 \text{ mpg}}$

c. Would you consider this linear model a "good" linear model? (must mention all four factors!)

1. r = -0.949 showing a strong, negative linear relationship

2. r^2 = .90 which tells us that most of the variation in data is accounted for by the linear model

3. $S_e \rightarrow$ residuals range from -3 to 4 which is less than 10% of the y-intercept (43.4) which is good

4. residual plot does not show any distinct pattern