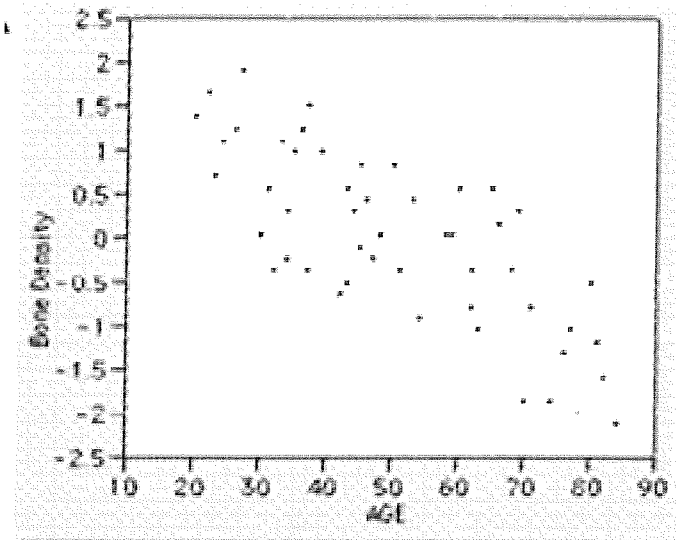


Out of 21 points

Chapter 3 Test

Name Key

1. Use the scatterplot below which shows bone densities and age for a group of women.



1) a) What variable is the explanatory variable?

Age

1) b) What variable is the response variable?

Bone Density

1) c) What does each dot represent?

A woman

1) d) What is the direction?

Negative

1) e) What is the shape?

Linear

1) f) Make an estimate of the correlation coefficient?

-0.7

2) g) If the slope of the best fit line is -0.06, write a sentence explaining the slope in the context of this problem.

-0.06 bone density  
1 year

Each year, a woman decreases bone density by 0.06.

2. Listed below are the gold medals winning men's weight-lifting performances at the 2012 Olympics.

Weight Class (kg)	Name	Weight Lifted (kg)
56	Yun Om	293
62	Un Kim	327
69	Qingfeng Lin	344
77	Xiaojun Lu	379
85	Adrian Zielinski	385
94	Ilya Ilyin	406
105	Oleksiy Torokhtiy	412

- a) Use your calculator to find the regression line (line of best fit) that would be used to predict the weight lifted using the weight class. Also give the correlation coefficient. Write your equation and the r-value below to the nearest two decimal places.

(2)

Equation:

$$\hat{y} = 2.39x + 176.61$$

(2)

r =

$$0.96$$

- b) Use the regression equation to predict the weight lifted for a male gold medal winner at the Olympics in a weight class of 80 kg. **Show what you calculate and round to two decimal places.**

(2)

$$\hat{y} = 2.39(80) + 176.61 = (367.81)$$

3. An analysis of 77 breakfast cereals revealed that potassium and fiber were related by the following regression line  $\widehat{\text{potassium}} = 38 + 27(\text{fiber})$ .

a) What is the y-intercept in this equation?

38

(1)

b) Write a sentence explaining the y-intercept in the context of this problem.

(2)

When the fiber is zero, the predicted potassium is 38.

c) Is the y-intercept reasonable? Explain.

(1)

Maybe, but it is more likely that the potassium would be lower if it has 0 fiber.

d) Identify the slope of this equation.

(1)

27

e) Write a sentence explaining the slope in the context of this problem.

(2)

$\frac{27 \text{ potassium}}{1 \text{ fiber}}$

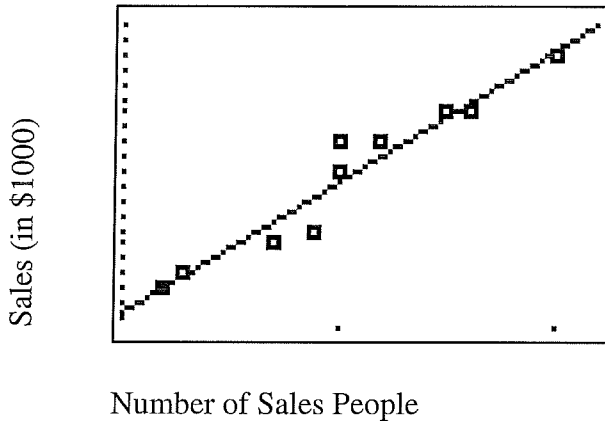
For each 1 fiber increase, the potassium goes up by 27.

4. A manager wants to predict the sales (in thousands of dollars) using the number of sales people working.

# Sales People	Sales (in \$1000)
2	10
3	11
7	13
9	14
10	18
10	20
12	20
15	22
16	22
20	26

$$\hat{y} = 0.91x + 8.1$$

$$r = 0.97$$



- a) Use the equation to predict the sales when there are 9 sales people working. **Show what you calculate.**

$$0.91(9) + 8.1 = 16.29 \text{ thousand dollars}$$

$$= \$16,290$$

- b) Calculate the residual for the predicted value you calculated in part (a). **Show what you calculate.**

$$\text{residual} = \text{actual} - \text{predicted}$$

$$= 14 - 16.29$$

$$= -2.29 \text{ thousand} = \$-2,290$$

- c) Comment on the confidence you have in the accuracy of the predictions for this data. Explain.

Predictions are very accurate since  $r$  (correlation coefficient) is very close to 1 provided the predictions are <sup>for</sup> between 2 and 20 sales people.