

Test 2

3/3/06

Instructions: Show all your work. You may round all decimals to two decimal places unless otherwise specified. The words "explain" and "interpret" mean use complete sentences, proper capitalization, punctuation, etc.

Linear regression:

$$m = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2}$$

$$b = \frac{\sum y - m(\sum x)}{n}$$

 $n =$ number of data points

1. The online book company OHaganBooks.com has adjusted the price of their novels several times and measured the demand at each price. The results are in the following table

Price (\$)	5.50	10.00	12.00	15.00
Demand (monthly sales)	620	350	300	100

- (a) Use the data to find a linear regression model of the demand (number of novels sold each month) as a function of price.
- (b) Interpret the significance of the slope in terms of sales.
- (c) Use your linear model to predict the demand if the novels are priced at \$8.00 per novel.

2. Graph the region bounded by the inequalities and find the corner points.

$$\begin{cases} 3x + 2y \geq 6 \\ 3x - 2y \leq 6 \\ 2x + 3y \geq 6 \\ x + y \leq 7 \\ x \geq 0 \end{cases}$$

3. Using the constraints given in problem #2

a) minimize $p = -2x + 7y$.

b) maximize $p = 5x + y$.

4. The following table gives information for four computer stocks.

Stock	Price(\$)	Dividend Yield (%)	Earnings Per Share (\$)
IBM	100	0.5	4.00
Hewlett Packard	20	1.50	0.40
Dell	25	0	0.50
Compaq	10	0.90	0.10

You are planning to invest up to \$10,000 in IBM and Hewlett Packard shares. You want your investment to yield at least \$100 in dividends, and you want to maximize your total earnings. How many shares of each company should you purchase? (*Hint: If you purchase x shares of IBM stock at \$100 per share, then your total dividends will be $(0.005)(100)x$ and your total earnings will be $4x$.*)