CASE 2–26 Mixed Cost Analysis and the Relevant Range [LO 2–3, LO 2–4]

The Ramon Company is a manufacturer that is interested in developing a cost formula to estimate the fixed and variable components of its monthly manufacturing overhead costs. The company wishes to use machine-hours as its measure of activity and has gathered the data below for this year and last year:

	Last Year		This Year	
Month	Machine-Hours	Overhead Costs	Machine-Hours	Overhead Costs
January	21,000	$84,000	21,000	$86,000
February	25,000	$99,000	24,000	$93,000
March	22,000	$89,500	23,000	$93,000
April	23,000	$90,000	22,000	$87,000
May	20,500	$81,500	20,000	$80,000
June	19,000	$75,500	18,000	$76,500
July	14,000	$70,500	12,000	$67,500
August	10,000	$64,500	13,000	$71,000
September	12,000	$69,000	15,000	$73,500
October	17,000	$75,000	17,000	$72,500
November	16,000	$71,500	15,000	$71,000
December	19,000	$78,000	18,000	$75,000

The company leases all of its manufacturing equipment. The lease arrangement calls for a flat monthly fee up to 19,500 machine-hours. If the machine-hours used exceeds 19,500, then the fee becomes strictly variable with respect to the total number of machine-hours consumed during the month. Lease expense is a major element of overhead cost.

Required:

1. Using the high-low method, estimate a manufacturing overhead cost formula.
2. Prepare a scattergraph using all of the data for the two-year period. Fit a straight line or lines to the plotted points using a ruler. Describe the cost behavior pattern revealed by your scattergraph plot.
3. Assume a least-squares regression analysis using all of the given data points estimated the total fixed costs to be $40,102 and the variable costs to be $2.13 per machine-hour. Do you have any concerns about the accuracy of the high-low estimates that you have computed or the least-squares regression estimates that have been provided?
4. Assume that the company consumes 22,500 machine-hours during a month. Using the high-low method, estimate the total overhead cost that would be incurred at this level of activity. Be sure to consider only the data points contained in the relevant range of activity when performing your computations.
5. Comment on the accuracy of your high-low estimates assuming a least-squares regression analysis using only the data points in the relevant range of activity estimated the total fixed costs to be $10,090 and the variable costs to be $3.53 per machine-hour.

CASE 2A–5 Analysis of Mixed Costs in a Pricing Decision [LO 2–3, LO 2–8]

Jasmine Lee owns a catering company that serves food and beverages at exclusive parties and business functions. Lee's business is seasonal, with a heavy schedule during the summer months and holidays and a lighter schedule at other times.

One of the major events that Lee's customers request is a cocktail party. She offers a standard cocktail party and has estimated the cost per guest for this party as follows:

Food and beverages	$17.00
Labor (0.5 hour @ $10.00 per hour)	5.00
Overhead (0.5 hour @ $18.63 per hour)	9.32
Total cost per guest	$31.32

This standard cocktail party lasts three hours and Lee hires one worker for every six guests, which is one-half hour of labor per guest. These workers are hired only as needed and are paid only for the hours they actually work.

Lee ordinarily charges $45 per guest. She is confident about her estimates of the costs of food and beverages and labor, but is not as comfortable with the estimate of overhead cost. The $18.63 overhead cost per labor-hour was determined by dividing total overhead expenses for the last 12 months by total labor-hours for the same period. Monthly data concerning overhead costs and labor-hours appear below:

Month	Labor Hours	Overhead Expenses
January	1,500	$ 44,000
February	1,680	47,200
March	1,800	48,000
April	2,520	51,200
May	2,700	53,600
June	3,300	56,800
July	3,900	59,200
August	4,500	61,600
September	4,200	60,000
October	2,700	54,400
November	1,860	49,600
December	3,900	58,400
Total	34,560	$644,000

Lee has received a request to bid on a 120-guest fund-raising cocktail party to be given next month by an important local charity. (The party would last the usual three hours.) She would like to win this contract because the guest list for this charity event includes many prominent individuals that she would like to land as future clients. Lee is confident that these potential customers would be favorably impressed by her company's services at the charity event.

Required:

1. Prepare a scattergraph plot that puts labor-hours on the *X*-axis and overhead expenses on the *Y*-axis. What insights are revealed by your scattergraph?
2. Use the least-squares regression method to estimate the fixed and variable components of overhead expenses.
3. Estimate the contribution to profit of a standard 120-guest cocktail party if Lee charges her usual price of $45 per guest. (In other words, by how much would her overall profit increase?)
4. How low could Lee bid for the charity event, in terms of a price per guest, and still not lose money on the event itself?
5. The individual who is organizing the charity's fund-raising event has indicated that he has already received a bid under $42 from another catering company. Do you think Lee should bid below her normal $45 per guest price for the charity event? Why or why not?

(CMA, adapted)