

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:

Month	Last Year		This Year	
	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

Month	Last Year		This Year	
	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.

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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.