Managerial Accounting for Managers, 5e (Noreen)
Appendix 2A: Analyzing Mixed Costs

1) The engineering approach to the analysis of mixed costs involves a detailed statistical analysis of cost behavior using methods that minimize the squared errors.

Answer: FALSE
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Remember
AACSB: Reflective Thinking
AICPA: BB Critical Thinking; FN Measurement

2) A major advantage of the high-low method of cost estimation is that it omits all data from the analysis other than the lowest and highest costs.

Answer: FALSE
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Understand
AACSB: Reflective Thinking
AICPA: BB Critical Thinking; FN Measurement

3) The highest and lowest costs are always used to analyze a mixed cost under the high-low method.

Answer: FALSE
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Understand
AACSB: Reflective Thinking
AICPA: BB Critical Thinking; FN Measurement

4) The high and low points used in the high-low method tend to be unusual and therefore the cost formula for the mixed cost may not accurately represent all of the data.

Answer: TRUE
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Remember
AACSB: Reflective Thinking
AICPA: BB Critical Thinking; FN Measurement

5) In a scattergraph of cost and activity, activity is the *independent* variable because it causes variations in the cost.

Answer: TRUE
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Remember
AACSB: Reflective Thinking
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6) Managers can use a variety of methods to estimate the fixed and variable components of a mixed cost. In account analysis, an account is classified as either variable or fixed based on the analyst's prior knowledge of how the cost in the account behaves.

Answer: TRUE
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Remember
AACSB: Reflective Thinking
AICPA: BB Critical Thinking; FN Measurement

7) The least-squares regression method computes the regression line that minimizes the sum of the squared deviations from the plotted points to the line.

Answer: TRUE
Difficulty: 2 Medium
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Understand
AACSB: Reflective Thinking
AICPA: BB Critical Thinking; FN Measurement

8) The R^2 (i.e., R-squared) tells us the percentage of the variation in the *dependent* variable (cost) that is explained by variation in the *independent* variable (activity).

Answer: TRUE
Difficulty: 1 Easy
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Remember
AACSB: Reflective Thinking
AICPA: BB Critical Thinking; FN Measurement

9) The R^2 (i.e., R-squared) varies from 0% to 100%, and the lower the percentage, the better the fit of the data to a straight line.

Answer: FALSE
Difficulty: 2 Medium
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Understand
AACSB: Reflective Thinking
AICPA: BB Critical Thinking; FN Measurement

10) A quick look at a scattergraph of cost versus activity can reveal that there is little relation between the cost and the activity or that the relation is something other than a simple straight line. In such cases, least square regression is highly recommended for estimating fixed and variable costs.

Answer: FALSE
Difficulty: 2 Medium
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Understand
AACSB: Reflective Thinking
AICPA: BB Critical Thinking; FN Measurement

11) Least-squares regression selects the values for the intercept and slope of a straight line that minimize the sum of the errors.

Answer: FALSE
Difficulty: 2 Medium
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Remember
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12) Which of the following statements is true when referring to the high-low method of cost analysis?
A) The high-low method has no major weaknesses.
B) The high-low method is very hard to apply.
C) In essence, the high-low method draws a straight line through two data points.
D) The high-low method uses all of the available data to estimate fixed and variable costs.

Answer: C
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Understand
AACSB: Reflective Thinking
AICPA: BB Critical Thinking; FN Measurement

13) In describing the cost formula equation, $Y = a + bX$, which of the following is correct:
A) "Y" is the independent variable.
B) "a" is the variable cost per unit.
C) "a" and "b" are valid for all levels of activity.
D) in the high-low method, "b" equals the change in cost divided by the change in activity.

Answer: D
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Understand
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14) Larker Brothers, Inc., used the high-low method to derive its cost formula for electrical power cost. According to the cost formula, the variable cost per unit of activity is $4 per machine-hour. Total electrical power cost at the high level of activity was $19,200 and at the low level of activity was $18,400. If the high level of activity was 3,300 machine hours, then the low level of activity was:
A) 3,100 machine hours
B) 3,200 machine hours
C) 3,000 machine hours
D) 2,900 machine hours

Answer: A
Explanation: Total cost = Total fixed cost + Total variable cost

High level of activity:

$19,200 = Total fixed cost + ($4 per machine-hour × 3,300 machine hours)

Total fixed cost = $19,200 − $13,200 = $6,000

Low level of activity:

$18,400 = $6,000 + ($4 per machine-hour × Low level of activity)

$4 per machine-hour × Low level of activity = $18,400 − $6,000 = $12,400

Low level of activity = 3,100 machine hours.
Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

15) Gamach Corporation is a wholesaler that sells a single product. Management has provided the following cost data for two levels of monthly sales volume. The company sells the product for $104.50 per unit.

Sales volume (units)	5,000	6,000
Cost of sales	$ 295,000	$ 354,000
Selling and administrative costs	$ 186,000	$ 202,800

The best estimate of the total monthly fixed cost is:
A) $102,000
B) $518,900
C) $556,800
D) $481,000

Answer: A

Explanation: Variable cost of sales per unit = Change in cost ÷ Change in activity

= ($354,000 – $295,000) ÷ (6,000 units – 5,000 units)

= $59,000 ÷ 1,000 units

= $59.00 per unit

Fixed cost of sales:

Total cost at 6,000 units	$ 354,000
Less variable cost element: 6,000 units × $59.00 per unit	354,000
Fixed cost	$ 0

Variable selling and administrative cost per unit = Change in cost ÷ Change in activity

= ($202,800 – $186,000) ÷ (6,000 units – 5,000 units)

= $16,800 ÷ 1,000 units

= $16.80 per unit

Fixed cost of sales:

Total cost at 6,000 units	$ 202,800
Less variable cost element: 6,000 units × $16.80 per unit	100,800
Fixed cost	$ 102,000

Total fixed cost = $0 + $102,000 = $102,000

Difficulty: 2 Medium

Topic: Diagnosing Cost Behavior with a Scattergraph

Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.

Bloom's: Apply

AACSB: Analytical Thinking

AICPA: BB Critical Thinking; FN Measurement

16) Hara Corporation is a wholesaler that sells a single product. Management has provided the following cost data for two levels of monthly sales volume. The company sells the product for $159.80 per unit.

Sales volume (units)	6,000	7,000
Cost of sales	$ 363,600	$ 424,200
Selling and administrative costs	$ 531,000	$ 547,400

The best estimate of the total variable cost per unit is: (**Round your intermediate calculations to 2 decimal places.**)
A) $77.00
B) $60.60
C) $149.10
D) $138.80

Answer: A
Explanation: Variable cost of sales = Change in cost ÷ Change in activity

= ($424,200 – $363,600) ÷ (7,000 units – 6,000 units)

= $60,600 ÷ 1,000 units

= $60.60 per unit

Variable selling and administrative cost = Change in cost ÷ Change in activity

= ($547,400 – $531,000) ÷ (7,000 units – 6,000 units)

= $16,400 ÷ 1,000 units

= $16.40 per unit

Total variable cost = Variable cost of sales + Variable selling and administrative cost

= $60.60 per unit + $16.40 per unit

= $77.00 per unit
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

17) Maintenance costs at a Straiton Corporation factory are listed below:

	Machine-Hours	Maintenance Cost
March	3,627	$ 54,384
April	3,588	$ 53,980
May	3,637	$ 54,453
June	3,638	$ 54,491
July	3,572	$ 53,843
August	3,611	$ 54,196
September	3,644	$ 54,550
October	3,609	$ 54,181
November	3,669	$ 54,767

Management believes that maintenance cost is a mixed cost that depends on machine-hours. Use the high-low method to estimate the variable and fixed components of this cost. Compute the variable component first and round off to the nearest whole cent. Compute the fixed component second and round off to the nearest whole dollar. These estimates would be closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $0.10 per machine-hour; $54,382 per month
B) $15.00 per machine-hour; $54,316 per month
C) $9.12 per machine-hour; $21,309 per month
D) $9.53 per machine-hour; $19,801 per month

Answer: D
Explanation:

	Machine-Hours	Maintenance Cost
High level of activity (November)	3,669	$ 54,767
Low level of activity (July)	3,572	53,843
Change	97	$ 924

Variable cost per unit = Change in cost ÷ Change in activity

= $924 ÷ 97 machine-hours

= $9.53 per machine-hour

Fixed cost = Total cost - Variable cost element

= $54,767 − ($9.53 per machine-hour × 3,669 machine-hours)

= $54,767 − $34,966

= $19,801

Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

18) Iacob Corporation is a wholesaler that sells a single product. Management has provided the following cost data for two levels of monthly sales volume. The company sells the product for $103.40 per unit.

	5,000	6,000
Sales volume (units)		
Cost of sales	$ 315,500	$ 378,600
Selling and administrative costs	$ 162,500	$ 177,600

The best estimate of the total contribution margin when 5,300 units are sold is: (**Round your intermediate calculations to 2 decimal places.**)
A) $56,710
B) $133,560
C) $41,340
D) $213,590

Answer: B

Explanation: Used the high-low method to estimate variable components of the costs:

Variable cost of sales = Change in cost ÷ Change in activity

= ($378,600 − $315,500) ÷ (6,000 units − 5,000 units)

= $63,100 ÷ 1,000 units

= $63.10 per unit

Variable selling and administrative cost = Change in cost ÷ Change in activity

= ($177,600 − $162,500) ÷ (6,000 units − 5,000 units)

= $15,100 ÷ 1,000 units

= $15.10 per unit

Total variable cost per unit = Variable cost of sales + Variable selling and administrative cost

= $63.10 per unit + $15.10 per unit = $78.20 per unit

Contribution margin per unit = Selling price per unit − Total variable cost per unit

= $103.40 per unit − $78.20 per unit = $25.20 per unit

Total contribution margin = Contribution margin per unit × Total unit sales

= $25.20 per unit × 5,300 units = $133,560
Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

19) Edal Corporation has provided the following production and total cost data for two levels of monthly production volume. The company produces a single product.

Production volume	5,000 units	6,000 units
Direct materials	$ 266,500	$ 319,800
Direct labor	$ 52,000	$ 62,400
Manufacturing overhead	$ 748,500	$ 769,200

The best estimate of the total variable manufacturing cost per unit is: (**Round your intermediate calculations to 2 decimal places.**)
A) $63.70
B) $84.40
C) $53.30
D) $20.70

Answer: B

Explanation: Direct materials cost per unit = Change in cost ÷ Change in activity

= ($319,800 – $266,500) ÷ (6,000 units – 5,000 units)

= $53,300 ÷ 1,000 units

= $53.30 per unit

Direct labor cost per unit = Change in cost ÷ Change in activity

= ($62,400 – $52,000) ÷ (6,000 units – 5,000 units)

= $10,400 ÷ 1,000 units

= $10.40 per unit

Variable manufacturing overhead per unit = Change in cost ÷ Change in activity

= ($769,200 – $748,500) ÷ (6,000 units – 5,000 units)

= $20,700 ÷ 1,000 units

= $20.70 per unit

Total variable manufacturing cost per unit = Direct materials per unit + Direct labor per unit + Variable manufacturing overhead per unit = $53.30 per unit + $10.40 per unit + $20.70 per unit

= $84.40 per unit
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

20) Bakan Corporation has provided the following production and average cost data for two levels of monthly production volume. The company produces a single product.

Production volume	3,000 units	4,000 units
Direct materials	$ 86.30 per unit	$ 86.30 per unit
Direct labor	$ 26.40 per unit	$ 26.40 per unit
Manufacturing overhead	$ 75.90 per unit	$ 60.40 per unit

The best estimate of the total variable manufacturing cost per unit is: **(Round your intermediate calculations to 2 decimal places.)**
A) $126.60
B) $86.30
C) $13.90
D) $112.70

Answer: A
Explanation: Total manufacturing overhead at 4,000 units = 4,000 units × $60.40 per unit = $241,600

Total manufacturing overhead at 3,000 units = 3,000 units × $75.90 per unit = $227,700

Variable manufacturing overhead per unit = Change in cost ÷ Change in activity

= ($241,600 – $227,700) ÷ (4,000 units – 3,000 units)

= $13,900 ÷ 1,000 units

= $13.90 per unit

Total variable manufacturing cost = Direct materials + Direct labor + Variable manufacturing overhead

= $86.30 per unit + $26.40 per unit + $13.90 per unit

= $126.60 per unit
Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

21) Supply costs at Coulthard Corporation's chain of gyms are listed below:

	Client-Visits	Supply Cost
March	12,855	$ 23,598
April	12,283	$ 23,278
May	13,104	$ 23,742
June	12,850	$ 23,607
July	12,493	$ 23,415
August	12,794	$ 23,562
September	12,686	$ 23,496
October	12,765	$ 23,541
November	13,018	$ 23,687

Management believes that supply cost is a mixed cost that depends on client-visits. Use the high-low method to estimate the variable and fixed components of this cost. Compute the variable component first, rounding off to the nearest whole cent. Then compute the fixed component, rounding off to the nearest whole dollar. Those estimates are closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $1.85 per client-visit; $23,547 per month
B) $1.77 per client-visit; $557 per month
C) $0.55 per client-visit; $16,579 per month
D) $0.57 per client-visit; $16,273 per month

Answer: D
Explanation:

	Client-Visits	Supply Cost
High level of activity (May)	13,104	$ 23,742
Low level of activity (April)	12,283	23,278
Change	821	$ 464

Variable cost per unit = Change in cost ÷ Change in activity

= $464 ÷ 821 client-visits

= $0.57 per client-visit

Fixed cost = Total cost – Variable cost element

= $23,742 – ($0.57 per client-visit × 13,104 client-visits)

= $23,742 – $7,469

= $16,273
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

22) Electrical costs at one of Finfrock Corporation's factories are listed below:

	Machine-Hours	Electrical Cost
March	3,642	$ 40,537
April	3,616	$ 40,319
May	3,667	$ 40,706
June	3,634	$ 40,462
July	3,665	$ 40,703
August	3,659	$ 40,680
September	3,644	$ 40,547
October	3,612	$ 40,268
November	3,624	$ 40,364

Management believes that electrical cost is a mixed cost that depends on machine-hours. Use the high-low method to estimate the variable and fixed components of this cost. Compute the variable component first, rounding off to the nearest whole cent. Then compute the fixed component, rounding off to the nearest whole dollar. Those estimates are closest to: (**Round your intermediate calculations to 2 decimal places.**)
A) $7.96 per machine-hour; $11,517 per month
B) $11.13 per machine-hour; $40,510 per month
C) $9.61 per machine-hour; $5,533 per month
D) $0.13 per machine-hour; $40,246 per month

Answer: A
Explanation:

	Machine-Hours	Electrical Cost
High level of activity (May)	3,667	$ 40,706
Low level of activity (October)	3,612	40,268
Change	55	$ 438

Variable cost per unit = Change in cost ÷ Change in activity

= $438 ÷ 55 machine-hours

= $7.96 per machine-hour

Fixed cost = Total cost – Variable cost element

= $40,706 – ($7.96 per machine-hour × 3,667 machine-hours)

= $40,706 – $29,189

= $11,517
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

23) Deidoro Company has provided the following data for maintenance cost:

	Prior Year	Current Year
Machine hours	8,000	10,000
Maintenance cost	$ 26,600	$ 31,000

Maintenance cost is a mixed cost with variable and fixed components. The fixed and variable components of maintenance cost are closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $26,600 per year; $3.10 per machine hour
B) $9,000 per year; $2.20 per machine hour
C) $9,000 per year; $3.10 per machine hour
D) $26,600 per year; $2.20 per machine hour

Answer: B
Explanation:

	Machine-Hours	Maintenance Cost
High level of activity	10,000	$ 31,000
Low level of activity	8,000	26,600
Change	2,000	$ 4,400

Variable cost per unit = Change in cost ÷ Change in activity

= $4,400 ÷ 2,000 machine-hours

= $2.20 per machine-hour

Fixed cost = Total cost − Variable cost element

= $31,000 − ($2.20 per machine-hour × 10,000 machine-hours)

= $31,000 − $22,000

= $9,000
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

24) Caraco Corporation has provided the following production and average cost data for two levels of monthly production volume. The company produces a single product.

	7,000 units	8,000 units
Production volume	7,000 units	8,000 units
Direct materials	$ 87.40 per unit	$ 87.40 per unit
Direct labor	$ 20.20 per unit	$ 20.20 per unit
Manufacturing overhead	$ 101.50 per unit	$ 90.80 per unit

The best estimate of the total cost to manufacture 7,300 units is closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $1,487,375
B) $1,448,320
C) $1,500,750
D) $1,526,430

Answer: C

Explanation: Total manufacturing overhead at 8,000 units = 8,000 units × $90.80 per unit = $726,400

Total manufacturing overhead at 7,000 units = 7,000 units × $101.50 per unit = $710,500

Variable manufacturing overhead per unit = Change in cost ÷ Change in activity

= ($726,400 – $710,500) ÷ (8,000 units – 7,000 units)

= $15,900 ÷ 1,000 units

= $15.90 per unit

Fixed cost element of manufacturing overhead = Total cost – Variable cost element

= $726,400 – (8,000 units × $15.90 per unit)

= $726,400 – $127,200

= $599,200

Total variable manufacturing cost = Direct materials + Direct labor + Manufacturing overhead

= ($87.40 per unit + $20.20 per unit) + $15.90 per unit

= $123.50 per unit

Total manufacturing cost = (Total variable manufacturing cost per unit × Total units manufactured) + Total fixed manufacturing cost

= ($123.50 per unit × 7,300 units) + $599,200

= $901,550 + $599,200

= $1,500,750

Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

25) A soft drink bottler incurred the following factory utility cost: $9,246 for 5,200 cases bottled and $8,997 for 4,900 cases bottled. Factory utility cost is a mixed cost containing both fixed and variable components. The variable factory utility cost per case bottled is closest to:
A) $1.81
B) $1.78
C) $1.84
D) $0.83

Answer: D
Explanation:

	Units	Utility Cost
High level of activity	5,200	$ 9,246
Low level of activity	4,900	8,997
Change	300	$ 249

Variable cost per unit = Change in cost ÷ Change in activity

= $249 ÷ 300 units

= $0.83 per unit
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

26) Andom Corporation has provided the following production and average cost data for two levels of monthly production volume. The company produces a single product.

Production volume	1,000 units	2,000 units
Direct materials	$ 15.20 per unit	$ 15.20 per unit
Direct labor	$ 30.50 per unit	$ 30.50 per unit
Manufacturing overhead	$ 54.10 per unit	$ 37.40 per unit

The best estimate of the total monthly fixed manufacturing cost is: **(Round your intermediate calculations to 2 decimal places.)**
A) $74,800
B) $54,100
C) $99,800
D) $33,400

Answer: D
Explanation: Both direct materials and direct labor are variable costs.

Total manufacturing overhead at 1,000 units = $54.10 per unit × 1,000 units = $54,100

Total manufacturing overhead at 2,000 units = $37.40 per unit × 2,000 units = $74,800

Variable element of manufacturing overhead = Change in cost ÷ Change in activity

= ($74,800 – $54,100) ÷ (2,000 units – 1,000 units)

= $20,700 ÷ 1,000 units

= $20.70 per unit

Fixed cost element of manufacturing overhead = Total cost – Total variable cost

= $74,800 – ($20.70 per unit × 2,000 units)

= $74,800 – $41,400

= $33,400
Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

27) The following data pertains to activity and maintenance cost for two recent periods:

Activity level (units)	8,000	7,000
Maintenance cost	$ 34,000	$ 31,500

Maintenance cost is a mixed cost with both fixed and variable components. Using the high-low method, the cost formula for maintenance cost is: **(Round your intermediate calculations to 2 decimal places.)**
A) Y = $4.25 X
B) Y = $14,000 + $2.50 X
C) Y = $2,500 + $4.25 X
D) Y = $4.50 X

Answer: B
Explanation:

	Units	Maintenance Cost
High level of activity	8,000	$ 34,000
Low level of activity	7,000	31,500
Change	1,000	$ 2,500

Variable cost per unit = Change in cost ÷ Change in activity

= $2,500 ÷ 1,000 units

= $2.50 per unit

Fixed cost = Total cost − Variable cost element

= $34,000 − ($2.50 per unit × 8,000 units)

= $34,000 − $20,000

= $14,000
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

28) Farac Corporation has provided the following production and total cost data for two levels of monthly production volume. The company produces a single product.

Production volume	4,000 units	5,000 units
Direct materials	$ 208,800	$ 261,000
Direct labor	$ 119,200	$ 149,000
Manufacturing overhead	$ 319,200	$ 329,500

The best estimate of the total cost to manufacture 4,300 units is closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $674,890
B) $665,855
C) $695,740
D) $635,970

Answer: A
Explanation: Direct materials is a variable cost, so it can be computed as follows:

Direct materials cost per unit = $208,800 / 4,000 units = $52.20 per unit

Direct labor could also be computed the same way, but just to make sure it is purely a variable cost, we'll use the high-low method:

Variable direct labor cost per unit = Change in cost ÷ Change in activity

= ($149,000 − $119,200) ÷ (5,000 units − 4,000 units)

= $29,800 ÷ 1,000 units

= $29.80 per unit

Direct labor fixed cost element = Total cost − Variable cost element

= $149,000 − ($29.80 per unit × 5,000 units)

= $149,000 − $149,000 = $0

Variable manufacturing overhead cost per unit = Change in cost ÷ Change in activity

= ($329,500 – $319,200) ÷ (5,000 units – 4,000 units)

= $10,300 ÷ 1,000 units

= $10.30 per unit

Manufacturing overhead fixed cost element = Total cost – Variable cost element

= $329,500 – ($10.30 per unit × 5,000 units)

= $329,500 – $51,500 = $278,000

Total variable cost = Direct materials + Direct labor + Variable manufacturing overhead

= $52.20 per unit + $29.80 per unit + $10.30 per unit

= $92.30 per unit

Total fixed overhead cost = $278,000

Total cost to manufacture 4,300 units = Total fixed cost + Total variable cost

= $278,000 + ($92.30 per unit × 4,300 units)

= $278,000 + $396,890

= $674,890
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

29) The following data pertains to activity and utility cost for two recent periods:

Activity level (units)	15,000	12,000
Utility cost	$ 24,750	$ 21,000

Utility cost is a mixed cost with both fixed and variable components. Using the high-low method, the cost formula for utility cost is: **(Round your intermediate calculations to 2 decimal places.)**
A) Y = $1.65 X
B) Y = $1.75 X
C) Y = $3,750 + $1.75 X
D) Y = $6,000 + $1.25 X

Answer: D
Explanation:

	Units	Utility Cost
High level of activity	15,000	$ 24,750
Low level of activity	12,000	21,000
Change	3,000	$ 3,750

Variable cost per unit = Change in cost ÷ Change in activity

= $3,750 ÷ 3,000 units

= $1.25 per unit

Fixed cost = Total cost – Variable cost element

= $24,750 – ($1.25 per unit × 15,000 units)

= $24,750 – $18,750

= $6,000
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

30) Dacosta Corporation has provided the following production and total cost data for two levels of monthly production volume. The company produces a single product.

Production volume	6,000 units	7,000 units
Direct materials	$ 369,600	$ 431,200
Direct labor	$ 309,600	$ 361,200
Manufacturing overhead	$ 919,800	$937,300

The best estimate of the total monthly fixed manufacturing cost is: **(Round your intermediate calculations to 2 decimal places.)**
A) $1,599,000
B) $1,664,350
C) $814,800
D) $1,729,700

Answer: C
Explanation: Direct materials and direct labor are both strictly variable costs in this company.

Variable manufacturing overhead cost per unit = Change in cost ÷ Change in activity

= ($937,300 – $919,800) ÷ (7,000 units – 6,000 units)

= $17,500 ÷ 1,000 units

= $17.50 per unit

Fixed cost element of manufacturing overhead = Total cost – Variable cost element

= $937,300 – (7,000 units × $17.50 per unit)

= $937,300 – $122,500

= $814,800
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

31) Seifer Inc.'s inspection costs are listed below:

	Units Produced	Inspection Costs
April	119	$ 8,558
May	117	$ 8,535
June	113	$ 8,415
July	125	$ 8,736
August	152	$ 9,357
September	108	$ 8,320
October	120	$ 8,603
November	192	$ 10,337

Management believes that inspection cost is a mixed cost that depends on the number of units produced. Using the least-squares regression method, the estimates of the variable and fixed components of inspection cost would be closest to:
A) $24.08 per unit plus $5,709 per month
B) $67.74 per unit plus $8,858 per month
C) $24.37 per unit plus $5,658 per month
D) $24.01 per unit plus $5,727 per month

Answer: A
Explanation: Using Microsoft Excel, the solution is:

Intercept	$ 5,709	Fixed cost
Slope	$ 24.08	Variable cost
R^2	1.00	

Difficulty: 3 Hard
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

32) Your boss would like you to estimate the fixed and variable components of a particular cost. Actual data for this cost over four recent periods appear below.

	Activity	Cost
Period 1	22	$ 121
Period 2	28	$ 132
Period 3	21	$ 117
Period 4	29	$ 134

Using the least-squares regression method, what is the cost formula for this cost?
A) Y = $75.89 + $1.02X
B) Y = $72.64 + $2.13X
C) Y = $ 0.00 + $5.04X
D) Y = $75.50 + $2.02X

Answer: D
Explanation: Using Microsoft Excel, the slope and intercept are:

Intercept	$ 75.50
Slope	$ 2.02
R^2	0.99

Therefore, the cost formula is $75.50 per activity plus $2.02 per unit or:

Y = $75.50 + $2.02X
Difficulty: 3 Hard
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

33) The management of Hamano Corporation would like for you to analyze their repair costs, which are listed below:

	Machine-Hours	Repair Costs
April	4,459	$ 98,523
May	4,426	$ 98,296
June	4,493	$ 98,781
July	4,417	$ 98,207
August	4,432	$ 98,349
September	4,446	$ 98,420
October	4,489	$ 98,749
November	4,475	$ 98,654

Management believes that repair cost is a mixed cost that depends on the number of machine-hours. Using the least-squares regression method, the estimates of the variable and fixed components of repair cost would be closest to:
A) $22.11 per machine-hour plus $98,497 per month
B) $7.37 per machine-hour plus $65,670 per month
C) $8.19 per machine-hour plus $62,015 per month
D) $7.55 per machine-hour plus $64,859 per month

Answer: B
Explanation: Using Microsoft Excel, the solution is:

Intercept	$ 65,670	Fixed cost
Slope	$ 7.37	Variable cost
R^2	0.997	

Difficulty: 3 Hard
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

34) One of Matthew Corporation's competitors has learned that Matthew has a total expense per unit of $1.50 at the 15,000 unit level of activity and total expense per unit of $1.45 at the 20,000 unit level of activity. Assume that the relevant range includes all of the activity levels mentioned in this problem.

What would be the competitor's prediction of variable cost per unit for Matthew Corporation?
A) $1.30
B) $0.77
C) $1.50
D) $1.45

Answer: A
Explanation:

	Units	Total Expense
High activity level ($1.45 per unit × 20,000 units)	20,000	$ 29,000
Low activity level ($1.50 per unit × 15,000 units)	15,000	$ 22,500
Change	5,000	$ 6,500

Variable cost = Change in cost ÷ Change in activity = $6,500 ÷ 5,000 units = $1.30 per unit
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

35) One of Matthew Corporation's competitors has learned that Matthew has a total expense per unit of $1.50 at the 15,000 unit level of activity and total expense per unit of $1.45 at the 20,000 unit level of activity. Assume that the relevant range includes all of the activity levels mentioned in this problem.

What would be the competitor's prediction of total fixed cost per period? (**Round your intermediate calculations to 2 decimal places.**)
A) $22,500
B) $28,000
C) $13,600
D) $ 3,000

Answer: D
Explanation:

	Units	Total Expense
High activity level ($1.45 per unit × 20,000 units)	20,000	$ 29,000
Low activity level ($1.50 per unit × 15,000 units)	15,000	$ 22,500
Change	5,000	$ 6,500

Variable cost = Change in cost ÷ Change in activity = $6,500 ÷ 5,000 units = $1.30 per unit

Fixed cost element = Total cost – Variable cost element

= $29,000 – ($1.30 per unit × 20,000 units) = $3,000
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

36) One of Matthew Corporation's competitors has learned that Matthew has a total expense per unit of $1.50 at the 15,000 unit level of activity and total expense per unit of $1.45 at the 20,000 unit level of activity. Assume that the relevant range includes all of the activity levels mentioned in this problem.

What would be the competitor's prediction of total expected costs at 18,000 units? (**Round your intermediate calculations to 2 decimal places.**)
A) $16,860
B) $26,400
C) $29,100
D) $30,000

Answer: B
Explanation:

	Units	Total Expense
High activity level ($1.45 per unit × 20,000 units)	20,000	$ 29,000
Low activity level ($1.50 per unit × 15,000 units)	15,000	$ 22,500
Change	5,000	$ 6,500

Variable cost = Change in cost ÷ Change in activity = $6,500 ÷ 5,000 units = $1.30 per unit

Fixed cost element = Total cost – Variable cost element

= $29,000 – ($1.30 per unit × 20,000 units) = $3,000

Y = a + bX = $3,000 + ($1.30 per unit × 18,000 units) = $26,400
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

37) The following production and average cost data for two levels of monthly production volume have been supplied by a company that produces a single product:

Production volume	2,000 units	4,000 units
Direct materials	$ 88.40 per unit	$ 88.40 per unit
Direct labor	$ 20.60 per unit	$ 20.60 per unit
Manufacturing overhead	$ 86.90 per unit	$ 55.30 per unit

The best estimate of the total monthly fixed manufacturing cost is: **(Round your intermediate calculations to 2 decimal places.)**
A) $221,200
B) $391,800
C) $173,800
D) $126,400

Answer: D
Explanation: Total manufacturing overhead at 2,000 units = 2,000 units × $86.90 per unit = $173,800

Total manufacturing overhead at 4,000 units = 4,000 units × $55.30 per unit = $221,200

	Units Produced	Total Manufacturing Overhead
High level of activity	4,000	$ 221,200
Low level of activity	2,000	173,800
Change	2,000	$ 47,400

Variable cost per unit = Change in cost ÷ Change in activity

= $47,400 ÷ 2,000 units

= $23.70 per unit

Fixed cost = Total cost – Variable cost element

= $221,200 – ($23.70 per unit × 4,000 units)

= $221,200 – $94,800

= $126,400
Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

38) The following production and average cost data for two levels of monthly production volume have been supplied by a company that produces a single product:

Production volume	2,000 units	4,000 units
Direct materials	$ 88.40 per unit	$ 88.40 per unit
Direct labor	$ 20.60 per unit	$ 20.60 per unit
Manufacturing overhead	$ 86.90 per unit	$ 55.30 per unit

The best estimate of the total variable manufacturing cost per unit is: **(Round your intermediate calculations to 2 decimal places.)**
A) $132.70
B) $88.40
C) $23.70
D) $109.00

Answer: A

Explanation: Total manufacturing overhead at 2,000 units = 2,000 units × $86.90 per unit = $173,800

Total manufacturing overhead at 4,000 units = 4,000 units × $55.30 per unit = $221,200

	Units Produced	Total Manufacturing Overhead
High level of activity	4,000	$ 221,200
Low level of activity	2,000	173,800
Change	2,000	$ 47,400

Variable cost per unit = Change in cost ÷ Change in activity

= $47,400 ÷ 2,000 units

= $23.70 per unit

Total variable cost per unit = Direct materials per unit + Direct labor per unit + variable manufacturing overhead per unit

= $88.40 + $20.60 + $23.70

= $132.70

Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

39) The following production and average cost data for two levels of monthly production volume have been supplied by a company that produces a single product:

Production volume	2,000 units	4,000 units
Direct materials	$ 88.40 per unit	$ 88.40 per unit
Direct labor	$ 20.60 per unit	$ 20.60 per unit
Manufacturing overhead	$ 86.90 per unit	$ 55.30 per unit

The best estimate of the total cost to manufacture 2,200 units is closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $396,220
B) $430,980
C) $361,460
D) $418,340

Answer: D
Explanation: Total manufacturing overhead at 2,000 units = 2,000 units × $86.90 per unit = $173,800

Total manufacturing overhead at 4,000 units = 4,000 units × $55.30 per unit = $221,200

	Units Produced	Total Manufacturing Overhead
High level of activity	4,000	$ 221,200
Low level of activity	2,000	173,800
Change	2,000	$ 47,400

Variable cost per unit = Change in cost ÷ Change in activity

= $47,400 ÷ 2,000 units

= $23.70 per unit

Fixed cost = Total cost – Variable cost element

= $221,200 – ($23.70 per unit × 4,000 units)

= $221,200 – $94,800

= $126,400

Total variable cost per unit = Direct materials per unit + Direct labor per unit + variable manufacturing overhead per unit

= $88.40 + $20.60 + $23.70

= $132.70

Total cost = Total fixed cost + Total variable cost

= $126,400 + ($132.70 per unit × 2,200 units)

= $126,400 + $291,940

= $418,340
Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

40) Wilson Corporation's activity for the first six of the current year is as follows:

	Machine-Hours	Electrical Cost
January	2,000	$ 1,560
February	3,000	$ 2,200
March	2,400	$ 1,750
April	1,900	$ 1,520
May	1,800	$ 1,480
June	2,100	$ 1,600

Using the high-low method, the variable cost per machine hour would be:
A) $0.67
B) $0.64
C) $0.40
D) $0.60

Answer: D
Explanation:

	Machine-Hours	Electrical Cost
High activity level (February)	3,000	$ 2,200
Low activity level (May)	1,800	$ 1,480
Change	1,200	$ 720

Variable cost = Change in cost ÷ Change in activity

Variable cost = $720 ÷ 1,200 machine-hours = $0.60 per machine-hour
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

41) Wilson Corporation's activity for the first six of the current year is as follows:

	Machine-Hours	Electrical Cost
January	2,000	$ 1,560
February	3,000	$ 2,200
March	2,400	$ 1,750
April	1,900	$ 1,520
May	1,800	$ 1,480
June	2,100	$ 1,600

Using the high-low method, the fixed portion of the electrical cost each month would be:
(Round your intermediate calculations to 2 decimal places.)
A) $400
B) $760
C) $280
D) $190

Answer: A
Explanation:

	Machine-Hours	Electrical Cost
High activity level (February)	3,000	$ 2,200
Low activity level (May)	1,800	$ 1,480
Change	1,200	$ 720

Variable cost = Change in cost ÷ Change in activity

Variable cost = $720 ÷ 1,200 machine-hours = $0.60 per machine-hour

Fixed cost = Total cost – Variable cost

Fixed cost = $2,200 – ($0.60 per machine-hour × 3,000 machine-hours) = $400
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

42) Inspection costs at one of Ratulowski Corporation's factories are listed below:

	Units Produced	Inspection Costs
April	777	$ 10,176
May	807	$ 10,404
June	798	$ 10,355
July	835	$ 10,665
August	822	$ 10,542
September	795	$ 10,313
October	805	$ 10,409
November	853	$ 10,795
December	796	$ 10,310

Management believes that inspection cost is a mixed cost that depends on units produced.

Using the high-low method, the estimate of the variable component of inspection cost per unit produced is closest to:
A) $8.14
B) $7.05
C) $0.12
D) $12.89

Answer: A
Explanation:

	Units Produced	Inspection Cost
High level of activity (November)	853	$ 10,795
Low level of activity (April)	777	10,176
Change	76	$ 619

Variable cost per unit = Change in cost ÷ Change in activity

= $619 ÷ 76 units

= $8.14 per unit
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
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	Units Produced	Inspection Costs
April	777	$ 10,176
May	807	$ 10,404
June	798	$ 10,355
July	835	$ 10,665
August	822	$ 10,542
September	795	$ 10,313
October	805	$ 10,409
November	853	$ 10,795
December	796	$ 10,310

Management believes that inspection cost is a mixed cost that depends on units produced.

Using the high-low method, the estimate of the fixed component of inspection cost per month is closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $10,344
B) $10,441
C) $3,852
D) $10,176

Answer: C
Explanation:

	Units Produced	Inspection Cost
High level of activity (November)	853	$ 10,795
Low level of activity (April)	777	10,176
Change	76	$ 619

Variable cost per unit = Change in cost ÷ Change in activity

= $619 ÷ 76 units

= $8.14 per unit

Total fixed cost = Total cost – Variable cost element

= $10,795 – ($8.14 per unit × 853 units)

= $10,795 – $6,943

= $3,852

Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

44) Compton Corporation is a wholesale distributor of educational CD-ROMs. The company's records indicate the following:

	This Year	Last Year
Units Sold	250,000	200,000
Sales	$ 1,250,000	$ 1,000,000
Cost of goods sold	875,000	700,000
Gross margin	375,000	300,000
Selling and administrative expenses	222,000	210,000
Net operating income	$ 153,000	$ 90,000

Using the high-low method of analysis, what are the company's estimated variable selling and administrative expenses per unit?
A) $0.24
B) $4.17
C) $0.88
D) $0.96

Answer: A
Explanation:

	Units Sold	Cost Incurred
High activity level	250,000	$ 222,000
Low activity level	250,000	$ 210,000
Change	50,000	$ 12,000

Variable cost = Change in cost ÷ Change in activity = $12,000 ÷ 50,000 units = $0.24 per unit
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

45) Compton Corporation is a wholesale distributor of educational CD-ROMs. The company's records indicate the following:

	This Year	Last Year
Units Sold	250,000	200,000
Sales	$ 1,250,000	$ 1,000,000
Cost of goods sold	875,000	700,000
Gross margin	375,000	300,000
Selling and administrative expenses	222,000	210,000
Net operating income	$ 153,000	$ 90,000

Using the high-low method of analysis, what are the company's estimated total fixed selling and administrative expenses per year? (**Round your intermediate calculations to 2 decimal places.**)
A) $60,000
B) $174,000
C) $150,000
D) $162,000

Answer: D
Explanation:

	Units Sold	Cost Incurred
High activity level	250,000	$ 222,000
Low activity level	200,000	$ 210,000
Change	50,000	$ 12,000

Variable cost = Change in cost ÷ Change in activity = $12,000 ÷ 50,000 units = $0.24 per unit

Fixed cost = Total cost − Variable cost

Fixed cost = $222,000 − ($0.24 per unit × 250,000 units) = $162,000
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

46) Compton Corporation is a wholesale distributor of educational CD-ROMs. The company's records indicate the following:

	This Year	Last Year
Units Sold	250,000	200,000
Sales	$ 1,250,000	$ 1,000,000
Cost of goods sold	875,000	700,000
Gross margin	375,000	300,000
Selling and administrative expenses	222,000	210,000
Net operating income	$ 153,000	$ 90,000

What is the company's contribution margin for this year? (**Round your intermediate calculations to 2 decimal places.**)
A) $315,000
B) $(667,500)
C) $375,000
D) $213,000

Answer: A
Explanation:

	Units Sold	Cost Incurred
High activity level	250,000	$ 222,000
Low activity level	200,000	$ 210,000
Change	50,000	$ 12,000

Variable cost = Change in cost ÷ Change in activity = $12,000 ÷ 50,000 units = $0.24 per unit

Sales		$ 1,250,000
Variable expenses:		
Cost of goods sold	$ 875,000	
Variable selling and administrative ($0.24 per unit × 250,000 units)	60,000	935,000
Contribution margin		$ 315,000

Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

47) The Blaine Corporation is a highly automated manufacturer. At an activity level of 6,000 machine setups, total overhead costs equal $240,000. Of this amount, depreciation totals $80,000 (all fixed) and lubrication totals $72,000 (all variable). The remaining $88,000 of the total overhead cost consists of utility cost (mixed). At an activity level of 9,000 setups, utility cost totals $112,000.

Assume that the relevant range includes all of the activity levels mentioned in this problem.

The variable cost per setup for utilities is most likely closest to:
A) $ 8.00 per setup
B) $12.44 per setup
C) $ 4.00 per setup
D) $14.66 per setup

Answer: A
Explanation:

	Machine setups	Utility cost
High activity level	9,000	$ 112,000
Low activity level	6,000	$ 88,000
Change	3,000	$ 24,000

Variable cost = Change in cost ÷ Change in activity = $24,000 ÷ 3,000 machine setups = $8.00 per setup
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

48) The Blaine Corporation is a highly automated manufacturer. At an activity level of 6,000 machine setups, total overhead costs equal $240,000. Of this amount, depreciation totals $80,000 (all fixed) and lubrication totals $72,000 (all variable). The remaining $88,000 of the total overhead cost consists of utility cost (mixed). At an activity level of 9,000 setups, utility cost totals $112,000.

Assume that the relevant range includes all of the activity levels mentioned in this problem.

The total fixed overhead costs for Blaine Corporation are most likely closest to:
A) $112,000
B) $120,000
C) $ 40,000
D) $ 80,000

Answer: B
Explanation:

	Machine setups	Utility cost
High activity level	9,000	$ 112,000
Low activity level	6,000	$ 88,000
Change	3,000	$ 24,000

Variable cost = Change in cost ÷ Change in activity = $24,000 ÷ 3,000 machine setups = $8.00 per setup

Fixed cost element = Total cost – Variable cost element

= $112,000 – ($8.00 per setup × 9,000 units) = $40,000

Depreciation	$ 80,000
Fixed utility cost	40,000
Total	$ 120,000

Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

49) The Blaine Corporation is a highly automated manufacturer. At an activity level of 6,000 machine setups, total overhead costs equal $240,000. Of this amount, depreciation totals $80,000 (all fixed) and lubrication totals $72,000 (all variable). The remaining $88,000 of the total overhead cost consists of utility cost (mixed). At an activity level of 9,000 setups, utility cost totals $112,000.

Assume that the relevant range includes all of the activity levels mentioned in this problem.

If 7,800 setups are projected for the next period, total expected overhead cost would be closest to:
A) $156,000
B) $236,000
C) $214,400
D) $276,000

Answer: D
Explanation:

	Machine setups	Utility cost
High activity level	9,000	$ 112,000
Low activity level	6,000	$ 88,000
Change	3,000	$ 24,000

Variable cost = Change in cost ÷ Change in activity = $24,000 ÷ 3,000 machine setups = $8.00 per setup

Fixed cost element = Total cost – Variable cost element

= $112,000 – ($8.00 per setup × 9,000 units) = $40,000

Fixed costs:

Depreciation	$ 80,000
Fixed utility cost	40,000
Total	$ 120,000

Variable costs:

Lubrication ($72,000 ÷ 6,000 machine setups)	$ 12
Variable utility cost	8
Total variable cost	$ 20

Y = a + bX = $120,000 + ($20 per machine setup × 7,800 machine setups) = $276,000
Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

50) Babuca Corporation has provided the following production and total cost data for two levels of monthly production volume. The company produces a single product.

Production volume	5,000 units	6,000 units
Direct materials	$ 103,500	$ 124,200
Direct labor	$ 282,500	$ 339,000
Manufacturing overhead	$ 667,000	$ 679,800

The best estimate of the total monthly fixed manufacturing cost is: (**Round your intermediate calculations to 2 decimal places.**)
A) $1,098,000
B) $1,053,000
C) $1,143,000
D) $603,000

Answer: D
Explanation: Direct materials is a variable cost.

Direct labor is usually a variable cost, but it doesn't hurt to check.

Variable cost per unit = Change in cost ÷ Change in activity

= ($339,000 – $282,500) ÷ (6,000 units – 5,000 units)

= $56,500 ÷ 1,000 units

= $56.50 per unit

Fixed cost = Total cost – Variable cost element

= $339,000 – ($56.50 per unit × 6,000 units)

= $339,000 – 339,000

= $0

Manufacturing overhead:

Variable cost per unit = Change in cost ÷ Change in activity

= ($679,800 − $667,000) ÷ (6,000 units – 5,000 units)

= $12,800 ÷ 1,000 units

= $12.80 per unit

Fixed cost = Total cost – Variable cost element

= $679,800 – ($12.80 per unit × 6,000 units)

= $679,800 – $76,800

= $603,000

Total fixed cost per month = $0 + $603,000 = $603,000
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
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Production volume	5,000 units	6,000 units
Direct materials	$ 103,500	$ 124,200
Direct labor	$ 282,500	$ 339,000
Manufacturing overhead	$ 667,000	$ 679,800

The best estimate of the total variable manufacturing cost per unit is: **(Round your intermediate calculations to 2 decimal places.)**
A) $90.00
B) $77.20
C) $12.80
D) $20.70

Answer: A
Explanation: Note: There are several ways to compute the variable cost per unit for direct materials and direct labor.

Direct materials:

Variable cost per unit = Change in cost ÷ Change in activity

= ($124,200 − $103,500) ÷ (6,000 units − 5,000 units)

= $20,700 ÷ 1,000 units

= $20.70 per unit

Direct labor:

Variable cost per unit = Change in cost ÷ Change in activity

= ($339,000 − $282,500) ÷ (6,000 units − 5,000 units)

= $56,500 ÷ 1,000 units

= $56.50 per unit

Manufacturing overhead

Variable cost per unit = Change in cost ÷ Change in activity

= ($679,800 − $667,000) ÷ (6,000 units − 5,000 units)

= $12,800 ÷ 1,000 units

= $12.80 per unit

Total variable cost per unit = $20.70 per unit + $56.50 per unit + $12.80 per unit

= $90.00 per unit
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
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Production volume	5,000 units	6,000 units
Direct materials	$ 103,500	$ 124,200
Direct labor	$ 282,500	$ 339,000
Manufacturing overhead	$ 667,000	$ 679,800

The best estimate of the total cost to manufacture 5,300 units is closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $1,116,180
B) $1,062,915
C) $1,080,000
D) $1,009,650

Answer: C
Explanation: Note: There are several ways to compute the variable cost per unit for direct materials and direct labor.

Direct materials:

Variable cost per unit = Change in cost ÷ Change in activity

= ($124,200 − $103,500) ÷ (6,000 units − 5,000 units)

= $20,700 ÷ 1,000 units

= $20.70 per unit

Direct labor:

Variable cost per unit = Change in cost ÷ Change in activity

= ($339,000 − $282,500) ÷ (6,000 units − 5,000 units)

= $56,500 ÷ 1,000 units

= $56.50 per unit

Manufacturing overhead

Variable cost per unit = Change in cost ÷ Change in activity

= ($679,800 − $667,000) ÷ (6,000 units − 5,000 units)

= $12,800 ÷ 1,000 units

= $12.80 per unit

Total variable cost per unit = $20.70 per unit + $56.50 per unit + $12.80 per unit

= $90.00 per unit

Fixed cost = Total cost – Variable cost element

= $679,800 – ($12.80 per unit × 6,000 units)

= $679,800 – $76,800

= $603,000

Total fixed cost per month = $0 + $603,000 = $603,000

Total cost = Total fixed cost + Total variable cost

= $603,000 + ($90.00 per units × 5,300 units)

= $603,000 + $477,000

= $1,080,000
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

53) Wuensch Inc., an escrow agent, has provided the following data concerning its office expenses:

	Escrows Completed	Office Expenses
April	53	$ 7,427
May	94	$ 9,201
June	37	$ 6,769
July	87	$ 8,902
August	40	$ 6,875
September	38	$ 6,797
October	82	$ 8,681
November	35	$ 6,678
December	62	$ 7,836

Management believes that office expense is a mixed cost that depends on the number of escrows completed. Note: Real estate purchases usually involve the services of an escrow agent that holds funds and prepares documents to complete the transaction.

Using the high-low method, the estimate of the variable component of office expense per escrow completed is closest to:
A) $45.44
B) $42.76
C) $88.22
D) $131.00

Answer: B
Explanation:

	Escrows Completed	Office Expenses
High activity level (May)	94	$ 9,201
Low activity level (November)	35	6,678
Change	59	$ 2,523

Variable cost per unit = Change in cost ÷ Change in activity

= $2,523 ÷ 59 escrows

= $42.76 per escrow

Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
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Management believes that office expense is a mixed cost that depends on the number of escrows completed. Note: Real estate purchases usually involve the services of an escrow agent that holds funds and prepares documents to complete the transaction.

Using the high-low method, the estimate of the fixed component of office expense per month is closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $7,685
B) $7,182
C) $6,678
D) $5,182

Answer: D
Explanation:

	Escrows Completed	Office Expenses
High level of activity (May)	94	$ 9,201
Low level of activity (November)	35	6,678
Change	59	$ 2,523

Variable cost per unit = Change in cost ÷ Change in activity

= $2,523 ÷ 59 escrows

= $42.76 per escrow

Total fixed cost = Total cost – Variable cost element

= $9,201 – ($42.76 per escrow × 94 escrows)

= $9,201 – $4,019

= $5,182

Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

55) Electrical costs at one of Rome Corporation's factories are listed below:

	Machine-Hours	Electrical Cost
March	458	$ 1,007
April	423	$ 934
May	440	$ 979
June	409	$ 902
July	426	$ 952
August	372	$ 822
September	414	$ 926
October	431	$ 949
November	468	$ 1,025

Management believes that electrical cost is a mixed cost that depends on machine-hours.

Using the high-low method, the estimate of the variable component of electrical cost per machine-hour is closest to:
A) $2.11
B) $1.80
C) $2.21
D) $0.47

Answer: A
Explanation:

	Machine-Hours	Electrical Cost
High level of activity (November)	468	$ 1,025
Low level of activity (August)	372	$ 822
Change	96	$ 203

Variable cost per unit = Change in cost ÷ Change in activity

= $203 ÷ 96 machine-hours

= $2.11 per machine hour

Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
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August	372	$ 822
September	414	$ 926
October	431	$ 949
November	468	$ 1,025

Management believes that electrical cost is a mixed cost that depends on machine-hours.

Using the high-low method, the estimate of the fixed component of electrical cost per month is closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $822
B) $743
C) $38
D) $944

Answer: C
Explanation:

	Machine-Hours	Electrical Cost
High level of activity (November)	468	$ 1,025
Low level of activity (August)	372	$ 822
Change	96	$ 203

Variable cost per unit = Change in cost ÷ Change in activity

= $203 ÷ 96 machine-hours

= $2.11 per machine hour

Total fixed cost = Total cost – Variable cost element

= $1,025 – ($2.11 per machine-hour × 468 machine-hours)

= $1,025 – $987

= $38

Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

57) Callander Corporation is a wholesaler that sells a single product. Management has provided the following cost data for two levels of monthly sales volume. The company sells the product for $140.50 per unit.

	6,000	7,000
Sales volume (units)	6,000	7,000
Cost of sales	$ 497,400	$ 580,300
Selling and administrative costs	$ 273,600	$ 294,700

The best estimate of the total monthly fixed cost is: **(Round your intermediate calculations to 2 decimal places.)**
A) $875,000
B) $147,000
C) $771,000
D) $823,000

Answer: B
Explanation: Cost of sales is a variable cost.

Selling and administrative costs:

Variable cost per unit = Change in cost ÷ Change in activity

= ($294,700 – $273,600) ÷ (7,000 units – 6,000 units)

= $21,100 ÷ 1,000 units

= $21.10 per unit

Fixed cost = Total cost – Variable cost element

= $294,700 – ($21.10 per unit × 7,000 units)

= $294,700 – $147,700

= $147,000
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

58) Callander Corporation is a wholesaler that sells a single product. Management has provided the following cost data for two levels of monthly sales volume. The company sells the product for $140.50 per unit.

	6,000	7,000
Sales volume (units)	6,000	7,000
Cost of sales	$ 497,400	$ 580,300
Selling and administrative costs	$ 273,600	$ 294,700

The best estimate of the total variable cost per unit is: (**Round your intermediate calculations to 2 decimal places.**)
A) $82.90
B) $128.50
C) $104.00
D) $125.00

Answer: C
Explanation: Cost of sales:

Because cost of sales is a variable cost, there are several ways to compute the variable cost per unit. Here is one:

Variable cost per unit = Change in cost ÷ Change in activity

= ($580,300 − $497,400) ÷ (7,000 units − 6,000 units)

= $82,900 ÷ 1,000 units

= $82.90 per unit

Selling and administrative costs:

Variable cost per unit = Change in cost ÷ Change in activity

= ($294,700 − $273,600) ÷ (7,000 units − 6,000 units)

= $21,100 ÷ 1,000 units

= $21.10 per unit

Total variable cost per unit = $82.90 per unit + $21.10 per unit = $104.00
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
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	6,000	7,000
Sales volume (units)	6,000	7,000
Cost of sales	$ 497,400	$ 580,300
Selling and administrative costs	$ 273,600	$ 294,700

The best estimate of the total contribution margin when 6,300 units are sold is: **(Round your intermediate calculations to 2 decimal places.)**
A) $75,600
B) $97,650
C) $362,880
D) $229,950

Answer: D

Explanation: Variable cost per unit = Change in cost ÷ Change in activity

= ($580,300 – $497,400) ÷ (7,000 units – 6,000 units)

= $82,900 ÷ 1,000 units

= $82.90 per unit

Selling and administrative costs:

Variable cost per unit = Change in cost ÷ Change in activity

= ($294,700 – $273,600) ÷ (7,000 units – 6,000 units)

= $21,100 ÷ 1,000 units

= $21.10 per unit

Total variable cost per unit = $82.90 per unit + $21.10 per unit = $104.00

Contribution margin per unit = Selling price per unit – Variable cost per unit

= $140.50 per unit – $104.00 per unit

= $36.50 per unit

Total contribution margin = Contribution margin per unit × Unit sales

= $36.50 per unit × 6,300 units

= $229,950
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

60) The management of Casablanca Manufacturing Corporation believes that machine-hours is an appropriate measure of activity for overhead cost. Shown below are machine-hours and total overhead costs for the past six months:

	Machine-Hours	Overhead Cost
Jan	150,000	$ 339,000
Feb	140,000	$ 328,000
Mar	160,000	$ 350,000
Apr	130,000	$ 319,500
May	170,000	$ 362,500
Jun	200,000	$ 400,000

Assume that the relevant range includes all of the activity levels mentioned in this problem.

If Casablanca expects to incur 185,000 machine hours next month, what will the estimated total overhead cost be using the high-low method? (**Round your intermediate calculations to 2 decimal places.**)
A) $212,750
B) $359,750
C) $382,750
D) $381,700

Answer: C
Explanation:

	Machine-Hours	Overhead Cost
High activity level (Jun)	200,000	$ 400,000
Low activity level (Apr)	130,000	$ 319,500
Change	70,000	$ 80,500

Variable cost = Change in cost ÷ Change in activity = $80,500 ÷ 70,000 MHs = $1.15 per MH

Fixed cost element = Total cost – Variable cost element

= $400,000 – ($1.15 per MH × 200,000 MHs) = $170,000

Y = a + bX= $170,000 + ($1.15 per MH × 185,000 MHs) = $382,750
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
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Jan	150,000	$ 339,000
Feb	140,000	$ 328,000
Mar	160,000	$ 350,000
Apr	130,000	$ 319,500
May	170,000	$ 362,500
Jun	200,000	$ 400,000

Assume that the relevant range includes all of the activity levels mentioned in this problem.

What is Casablanca's independent variable?
A) the year
B) the machine hours
C) the total overhead cost
D) the relevant range

Answer: B
Explanation: The independent variable is the measure of activity which is machine-hours in this case.
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

62) Hiss Corporation's activity for the last six months is as follows:

	Machine Hours	Electrical Cost
July	2,000	$ 1,560
August	3,000	$ 2,230
September	2,400	$ 1,750
October	1,900	$ 1,520
November	1,800	$ 1,450
December	2,100	$ 1,600

Using the high-low method of analysis, the estimated variable cost per machine hour for electricity is closest to:
A) $0.40
B) $0.65
C) $0.70
D) $0.67

Answer: B
Explanation:

	Machine-Hours	Electrical Cost
High activity level (August)	3,000	$ 2,230
Low activity level (November)	1,800	$ 1,450
Change	1,200	$ 780

Variable cost = Change in cost ÷ Change in activity

Variable cost = $780 ÷ 1,200 machine-hours = $0.65 per machine-hour
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
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	Machine Hours	Electrical Cost
July	2,000	$ 1,560
August	3,000	$ 2,230
September	2,400	$ 1,750
October	1,900	$ 1,520
November	1,800	$ 1,450
December	2,100	$ 1,600

Using the high-low method of analysis, the estimated fixed cost per month for electricity is closest to: **(Round your intermediate calculations to 2 decimal places.)**
A) $260
B) $235
C) $280
D) $800

Answer: C
Explanation:

	Machine-Hours	Electrical Cost
High activity level (August)	3,000	$ 2,230
Low activity level (November)	1,800	$ 1,450
Change	1,200	$ 780

Variable cost = Change in cost ÷ Change in activity

Variable cost = $780 ÷ 1,200 machine-hours = $0.65 per machine-hour

Fixed cost = Total cost − Variable cost

Fixed cost = $2,230 − ($0.65 per machine-hour × 3,000 machine-hours) = $280
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

64) Jorgenson Corporation has provided the following data for the first five months of the year:

	Machine Hours	Lubrication Cost
January	240	$ 1,500
February	320	$ 1,600
March	400	$ 1,740
April	300	$ 1,580
May	340	$ 1,680

Using the high-low method of analysis, the estimated variable lubrication cost per machine hour is closest to:
A) $1.50
B) $1.25
C) $0.67
D) $1.40

Answer: A
Explanation:

	Machine-Hours	Lubrication Cost
High activity level (March)	400	$ 1,740
Low activity level (January)	240	$ 1,500
Change	160	$ 240

Variable cost = Change in cost ÷ Change in activity = $240 ÷ 160 machine hours = $1.50 per machine hour
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
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	Machine Hours	Lubrication Cost
January	240	$ 1,500
February	320	$ 1,600
March	400	$ 1,740
April	300	$ 1,580
May	340	$ 1,680

Using the high-low method of analysis, the estimated monthly fixed component of lubrication cost is closest to: (**Round your intermediate calculations to 2 decimal places.**)
A) $1,120
B) $1,140
C) $1,170
D) $1,130

Answer: B
Explanation:

	Machine-Hours	Lubrication Cost
High activity level (March)	400	$ 1,740
Low activity level (January)	240	$ 1,500
Change	160	$ 240

Variable cost = Change in cost ÷ Change in activity = $240 ÷ 160 machine hours = $1.50 per machine hour

Fixed cost = Total cost – Variable cost

Fixed cost = $1,740 – ($1.50 per machine hour × 400 machine hours) = $1,140
Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
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	Machine Hours	Lubrication Cost
January	240	$ 1,500
February	320	$ 1,600
March	400	$ 1,740
April	300	$ 1,580
May	340	$ 1,680

Using the least-squares regression method of analysis, the estimated variable lubrication cost per machine hour is closest to:
A) $0.80
B) $1.56
C) $1.40
D) $1.28

Answer: B
Explanation: The regression line is $Y = 1,121.18 + 1.5588X$ and the R^2 is 0.9607.

Therefore, the variable cost per machine hour for lubrication is closest to $1.56.
Difficulty: 3 Hard
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

67) Jorgenson Corporation has provided the following data for the first five months of the year:

	Machine Hours	Lubrication Cost
January	240	$ 1,500
February	320	$ 1,600
March	400	$ 1,740
April	300	$ 1,580
May	340	$ 1,680

Using the least-squares regression method of analysis, the estimated monthly fixed component of lubrication cost is closest to:
A) $1,050
B) $1,060
C) $1,121
D) $1,144

Answer: C
Explanation: The regression line is $Y = 1121.18 + 1.5588X$ and the R^2 is 0.9607.

Therefore, the fixed component of lubrication cost is closest to $1,121.
Difficulty: 3 Hard
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

68) Lacourse Inc.'s inspection costs are listed below:

	Units Produced	Inspection Costs
January	647	$ 15,309
February	724	$ 15,965
March	694	$ 15,715
April	645	$ 15,271
May	696	$ 15,745
June	665	$ 15,442
July	718	$ 15,933
August	699	$ 15,739

Management believes that inspection cost is a mixed cost that depends on units produced.

Using the least-squares regression method, the estimate of the variable component of inspection cost per unit produced is closest to:
A) $22.80
B) $8.82
C) $8.27
D) $8.78

Answer: B
Explanation: Using Microsoft Excel functions, the solution is:

Variable cost per unit produced = Slope = $8.82
Difficulty: 2 Medium
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

69) Lacourse Inc.'s inspection costs are listed below:

	Units Produced	Inspection Costs
January	647	$ 15,309
February	724	$ 15,965
March	694	$ 15,715
April	645	$ 15,271
May	696	$ 15,745
June	665	$ 15,442
July	718	$ 15,933
August	699	$ 15,739

Management believes that inspection cost is a mixed cost that depends on units produced.

Using the least-squares regression method, the estimate of the fixed component of inspection cost per month is closest to:
A) $9,608
B) $15,640
C) $9,587
D) $15,271

Answer: C
Explanation: Using Microsoft Excel functions, the solution is:

Fixed cost per month = Intercept = $9,587
Difficulty: 2 Medium
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

70) Recent maintenance costs of Divers Corporation are listed below:

	Machine-Hours	Maintenance Costs
February	527	$ 5,144
March	499	$ 5,033
April	542	$ 5,220
May	541	$ 5,196
June	489	$ 4,973
July	543	$ 5,200
August	558	$ 5,288
September	513	$ 5,060

Management believes that maintenance cost is a mixed cost that depends on machine-hours.

Using the least-squares regression method, the estimate of the variable component of maintenance cost per machine-hour is closest to:
A) $9.76
B) $6.00
C) $4.43
D) $4.57

Answer: C
Explanation: Using Microsoft Excel functions, the solution is:

Maintenance cost per machine-hour = Slope = $4.43
Difficulty: 2 Medium
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

71) Recent maintenance costs of Divers Corporation are listed below:

	Machine-Hours	Maintenance Costs
February	527	$ 5,144
March	499	$ 5,033
April	542	$ 5,220
May	541	$ 5,196
June	489	$ 4,973
July	543	$ 5,200
August	558	$ 5,288
September	513	$ 5,060

Management believes that maintenance cost is a mixed cost that depends on machine-hours.

Using the least-squares regression method, the estimate of the fixed component of maintenance cost per month is closest to:
A) $5,139
B) $2,806
C) $4,973
D) $2,738

Answer: B
Explanation: Using Microsoft Excel functions, the solution is:

Fixed maintenance cost per month = Intercept = $2,806
Difficulty: 2 Medium
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

72) Arlo's T-shirt Shop only has three costs: T-shirt cost, rent cost on the shop, and utilities cost. Arlo's sells the T-shirts for $14.50 each. Management has prepared the following cost information for next month:

	At 8,000 T-shirts	At 10,000 T-shirts
T-shirt cost	$48,000	$60,000
Rent cost	$3,600	$3,600
Utilities cost	$6,800	$8,300

Assume that all of the activity levels mentioned in this problem are within the relevant range.

Required:
a. Calculate Arlo's total variable cost if 9,000 T-shirts are sold next month.
b. Prepare Arlo's contribution format income statement if 10,000 T-shirts are sold.

Answer:
a.
T-shirt cost
Variable cost per unit = Change in cost ÷ Change in activity
= ($60,000 − $48,000) ÷ (10,000 T-shirts − 8,000 T-shirts)
= $12,000 ÷ 2,000 T-shirts
= $6 per T-shirt
Fixed cost = Total cost − Total variable cost
= $48,000 − (8,000 T-shirts × $6 per T-shirt)
= $0

Rent cost is fixed at $3,600 per month.

Utilities cost:
Variable cost per unit = Change in cost ÷ Change in activity
= ($8,300 − $6,800) ÷ (10,000 T-shirts − 8,000 T-shirts)
= $1,500 ÷ 2,000 T-shirts
= $0.75 per T-shirt
Fixed cost = Total cost − Total variable cost
= $8,300 − (8,000 T-shirts × $0.75 per T-shirt)
= $2,300
Y = $2,300 + $0.75X

T-shirt cost ($6 per T-shirt × 9,000 T-shirts)	$54,000
Utilities cost ($0.75 per T-shirt × 9,000 T-shirts)	6,750
Total variable cost	$60,750

b.

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Arlo's T-Shirt Shop
Contribution Format Income Statement
Monthly Sales Volume of 10,000 T-Shirts

</div>

Sales ($14.50 per unit × 10,000 units)		$145,000
Variable expenses:		
T-shirt cost ($6 per unit × 10,000 units)	$60,000	
Utilities cost ($0.75 per unit × 10,000 units)	7,500	67,500
Contribution margin		77,500
Fixed expenses:		
Rent cost	3,600	
Utilities cost	2,300	5,900
Net operating income		$ 71,600

Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

73) Butler Sales Company is a distributor that has an exclusive franchise to sell a particular product made by another company. Butler Sales Company's traditional format income statements for the last two years are given below:

	This Year	Last Year
Units sold	200,000	160,000
Sales revenue	$1,000,000	$800,000
Cost of goods sold	700,000	560,000
Gross margin	300,000	240,000
Selling and administrative expense	210,000	198,000
Net operating income	$90,000	$ 42,000

Selling and administrative expense is a mixture of fixed costs and variable costs that vary with respect to the number of units sold.

Required:
a. Estimate the company's variable selling and administration expense per unit, and its total fixed selling and administrative expense per year.
b. Compute the company's contribution margin for this year.

Answer:

a.

	Units sold	Cost
High level of activity	200,000	$210,000
Low level of activity	160,000	198,000
Change	40,000	$12,000

Variable cost = Change in cost ÷ Change in activity
Variable cost = $12,000 ÷ 40,000 units = $0.30 per unit

Fixed cost = Total cost − Variable cost
Fixed cost = $210,000 − ($0.30 per unit × 200,000 units) = $150,000

b.

Sales revenue		$1,000,000
Variable expenses:		
Cost of goods sold	$700,000	
Selling and administrative expenses		
($0.30 per unit x 200,000 units)	60,000	760,000
Contribution margin		$240,000

Difficulty: 2 Medium
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

74) The Stephens Leadership Center provides training seminars in personal development and time management. The company is relatively new and management is seeking information regarding the Center's cost structure. The following information has been gathered since the inception of the business in January of the current year:

	Seminars Offered	Costs Incurred
January	10	$17,000
February	12	$18,800
March	15	$20,900
April	18	$23,762
May	16	$21,800
June	13	$19,400

Required:
a. Using the high-low method, estimate the variable cost per seminar and the total fixed cost per month.
b. Using the least-squares method, estimate the variable cost per seminar and the total fixed cost per month.

Answer:
a. High-Low Method:

	Seminars Offered	Cost Incurred
High activity level (April)	18	$23,762
Low activity level (January)	10	$17,000
Change	8	$6,762

Variable cost = Change in Cost/Change in activity
Variable cost = $6,762 ÷ 8 seminars = $845.25 per seminar

Fixed cost = Total cost − Variable cost
Fixed cost = $23,762 − ($845.25 per seminar × 18 seminars) = $8,547.50

Y = $8,547.50 + $845.25X

b. Least-Squares Method:
Using Microsoft Excel functions, the estimates are:
Variable cost per seminar = Slope = $8,761
Total fixed cost per month = Intercept = $822.57
Y = $8,761 + $822.57X
Microsoft Excel.
Difficulty: 3 Hard
Topic: Diagnosing Cost Behavior with a Scattergraph; The Least-Squares Regression Method
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.; 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

75) The accounting department of Archer Company, a merchandising company, has prepared the following analysis:

Cost	Cost Formula
Cost of goods sold	$56 per unit
Sales commissions	12% of sales
Advertising expense	$300,000 per month
Administrative salaries	$160,000 per month
Billing expense	?
Depreciation expense	$62,000 per month

The accounting department feels that billing expense is a mixed cost, containing both fixed and variable cost elements. The billing expenses and sales in units over the last several months follow:

	Units Sold (thousands)	Billing Expense
January	9	$30,000
February	11	$33,000
March	14	$36,000
April	17	$42,000
May	15	$39,000
June	12	$35,000

The accounting department now plans to develop a cost formula for billing expense so that a contribution format income statement can be prepared for management's use.

Required:
a. Using the least-squares method, estimate the cost formula for billing expense. Round off both the fixed cost and the variable cost per thousand units sold to the nearest whole dollar.
b. Assume that the company plans to sell 30,000 units during July at a selling price of $100 per unit. Prepare a budgeted income statement for the month, using the contribution format.

Answer:
a. Using least-squares regression, the cost formula is
Y = $16,952 + $1,452X, where X is a thousand units.

b.

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Archer Company
Budgeted Income Statement
For the month of June
</div>

Sales ($100 per unit × 30,000 units)		$3,000,000
Variable expenses:		
Cost of goods sold ($56 per unit × 30,000 units)	$1,680,000	
Commissions (0.12 × $3,000,000)	360,000	
Billing expense ($1,452 × 30)	<u>43,560</u>	<u>2,083,560</u>
Contribution margin		916,440
Fixed expenses:		
Advertising expense	300,000	
Administrative salaries	160,000	
Billing expense	16,952	
Depreciation expense	<u>62,000</u>	<u>538,952</u>
Net operating income		<u>$377,488</u>

Difficulty: 3 Hard
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

76) Grawburg Inc. maintains a call center to take orders, answer questions, and handle complaints. The costs of the call center for a number of recent months are listed below:

	Calls Taken	Call Center Cost
April	9,030	$112,323
May	9,017	$112,278
June	9,035	$112,341
July	9,065	$112,458
August	9,015	$112,290
September	9,061	$112,419
October	9,070	$112,463
November	9,067	$112,439

Management believes that the cost of the call center is a mixed cost that depends on the number of calls taken.

Required:
Estimate the variable cost per call and fixed cost per month using the least-squares regression method.

Answer: Using Microsoft Excel functions, the solution is:
Variable cost per call = Slope = $3.27
Fixed cost per month = Intercept = $82,758
Difficulty: 3 Hard
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

77) Furlan Printing Corp., a book printer, has provided the following data:

	Titles Printed	Press Setup Cost
May	40	$6,649
June	38	$6,438
July	25	$5,307
August	28	$5,564
September	33	$6,030
October	27	$5,505
November	39	$6,551
December	36	$6,275

Management believes that the press setup cost is a mixed cost that depends on the number of titles printed. (A specific book that is to be printed is called a "title". Typically, thousands of copies will be printed of each title. Specific steps must be taken to setup the presses for printing each title-for example, changing the printing plates. The costs of these steps are the press setup costs.)

Required:
Estimate the variable cost per title printed and the fixed cost per month using the least-squares regression method.

Answer: The solution using Microsoft Excel functions is:
Variable cost per title printed = Slope = $88.21
Fixed cost per month = Intercept = $3,107

The solution using the formulas in the text is:
n = 8
ΣX = 266
ΣY = $48,319
ΣXY = $1,628,085
ΣX^2 = 9,088

b = $[n(\Sigma XY) - (\Sigma X)(\Sigma Y))]/[n(\Sigma X^2) - (\Sigma X)^2]$
= $[8(\$1,628,085) - (266)(\$48,319))]/[8(9,088) - (266)^2]$
= $88.21

a = $[(\Sigma Y) - b(\Sigma X)]/n$
= $[(\$48,319) - \$88.21(266)]/8$
= $3,107

Any difference in the solutions is due to rounding errors when the formulas are used.
Difficulty: 3 Hard
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

78) The management of Rutledge Corporation would like to better understand the behavior of the company's warranty costs. Those costs are listed below for a number of recent months:

	Product Returns	Warranty Cost
March	30	$3,648
April	37	$4,074
May	43	$4,460
June	41	$4,330
July	32	$3,756
August	48	$4,782
September	35	$3,932
October	33	$3,823

Management believes that warranty cost is a mixed cost that depends on the number of product returns.

Required:
Estimate the variable cost per product return and the fixed cost per month using the least-squares regression method.

Answer: The solution using Microsoft Excel functions is:
Variable cost per product return = Slope = $63.59
Fixed cost per month = Intercept = $1,724

The solution using the formulas in the text is:
$n = 8$
$\Sigma X = 299$
$\Sigma Y = \$32,805$
$\Sigma XY = \$1,242,995$
$\Sigma X^2 = 11,441$

$b = [n(\Sigma XY) - (\Sigma X)(\Sigma Y))]/[n(\Sigma X^2) - (\Sigma X)^2]$
$= [8(\$1,242,995) - (299)(\$32,805))]/[8(11,441) - (299)^2]$
$= \$63.59$

$a = [(\Sigma Y) - b(\Sigma X)]/n$
$= [(\$32,805) - \$63.59(299)]/8$
$= \$1,724$

Any difference in the solutions is due to rounding errors when the formulas are used.
Difficulty: 3 Hard
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

79) Below are cost and activity data for a particular cost over the last four periods. Your boss has asked you to analyze this cost so that management will have a better understanding of how this cost changes in response to changes in activity.

	Activity	Cost
Period 1	46	$791
Period 2	40	$738
Period 3	47	$807
Period 4	41	$746

Required:
Using the least-squares regression method, estimate the cost formula for this cost.

Answer: The solution using Microsoft Excel functions is:
Variable cost = Slope = $9.57
Fixed cost = Intercept = $354.31
Therefore, the cost formula is $354.31 per period plus $9.57 per unit of activity or:
Y = $354.31 + $9.57X

The solution using the formulas in the text is:
n = 4
$\Sigma X = 174$
$\Sigma Y = 3{,}082$
$\Sigma XY = 134{,}421$
$\Sigma X^2 = 7{,}606$

$b = [n(\Sigma XY)-(\Sigma X)(\Sigma Y)]/[n(\Sigma X^2)-(\Sigma X)^2]$
$= [4(134{,}421)-(174)(3{,}082)]/[4(7{,}606)-(174)^2]$
= $9.57 (rounded to nearest whole cent)

$a = [(\Sigma Y)-b(\Sigma X)]/n$
$= [(3{,}082)- 9.57(174)]/4$
= $354 (rounded to nearest whole dollar)

Cost formula: Y = $354 + $9.57X.
Difficulty: 3 Hard
Topic: The Least-Squares Regression Method
Learning Objective: 02-11 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the least-squares regression method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

80) Utility costs at one of Hannemann Corporation's factories are listed below:

	Machine-Hours	Utility Cost
March	5,021	$52,824
April	5,076	$53,287
May	5,074	$53,263
June	5,040	$52,991
July	5,087	$53,371
August	5,073	$53,251
September	5,075	$53,252
October	5,034	$52,916
November	5,062	$53,137

Management believes that utility cost is a mixed cost that depends on machine-hours.

Required:
Estimate the variable cost per machine-hour and the fixed cost per month using the high-low method. Show your work!

Answer:

	Machine-Hours	Utility Cost
High activity level (July)	5,087	$53,371
Low activity level (March)	5,021	$52,824
Change	66	$547

Variable cost = Change in cost ÷ Change in activity
Variable cost = $547 ÷ 66 machine-hours = $8.29 per machine-hour

Fixed cost = Total cost − Variable cost
Fixed cost = $52,824 − ($8.29 per machine-hour × 5,021 machine-hours) = $11,200
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

81) Swofford Inc. has provided the following data concerning its maintenance costs:

	Machine-Hours	Maintenance Cost
March	4,440	$50,950
April	4,431	$50,877
May	4,412	$50,696
June	4,460	$51,113
July	4,414	$50,711
August	4,433	$50,900
September	4,443	$50,976
October	4,415	$50,730
November	4,391	$50,530

Management believes that maintenance cost is a mixed cost that depends on machine-hours.

Required:
Estimate the variable cost per machine-hour and the fixed cost per month using the high-low method. Show your work!

Answer:

	Machine-Hours	Maintenance Cost
High activity level (June)	4,460	$51,113
Low activity level (November)	4,391	$50,530
Change	69	$583

Variable cost = Change in cost ÷ Change in activity
Variable cost = $583 ÷ 69 machine-hours = $8.45 per machine-hour

Fixed cost = Total cost − Variable cost
Fixed cost = $50,530 − ($8.45 per machine-hour × 4,391 machine-hours) = $13,426
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement

82) The management of Dethlefsen Corporation would like to have a better understanding of the behavior of its inspection costs. The company has provided the following data:

	Direct Labor-Hours	Inspection Cost
January	5,089	$33,122
February	5,042	$32,929
March	5,026	$32,870
April	5,073	$33,065
May	5,029	$32,906
June	5,040	$32,913
July	5,070	$33,050
August	5,027	$32,875
September	4,995	$32,746

Management believes that inspection cost is a mixed cost that depends on direct labor-hours.

Required:
Estimate the variable cost per direct labor-hour and the fixed cost per month using the high-low method. Show your work!

Answer:

	Direct Labor-Hours	Inspection Cost
High activity level (January)	5,089	$33,122
Low activity level (September)	4,995	$32,746
Change	94	$376

Variable cost = Change in cost ÷ Change in activity
Variable cost = $376 ÷ 94 direct labor-hours = $4.00 per direct labor-hour

Fixed cost = Total cost − Variable cost
Fixed cost = $32,746 − ($4.00 per direct labor-hour × 4,995 direct labor-hours) = $12,766
Difficulty: 1 Easy
Topic: Diagnosing Cost Behavior with a Scattergraph
Learning Objective: 02-10 (Appendix 2A) Analyze a mixed cost using a scattergraph plot and the high-low method.
Bloom's: Apply
AACSB: Analytical Thinking
AICPA: BB Critical Thinking; FN Measurement