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| 2 | Cost Behavior and Cost Estimation |

**Learning Objectives**

1. Identify basic cost behavior patterns and explain how changes in activity level affect total cost and unit cost. (Unit 2.1)

2. Estimate a cost equation from a set of cost data and predict future total cost from that equation. (Unit 2.2)

3. Prepare a contribution format income statement. (Unit 2.3)

**SOLUTIONS TO EXERCISES**

**Exercise 2-1**

a. TC(200) = (200 x $10 per return) + $600 fee = $2,600

TC(450) = (450 x $10 per return) + $600 fee = $5,100

TC(600) = (600 x $10 per return) + $600 fee = $6,600

b. Cost per unit (200) = $2,600 ÷ 2,600 = $13.00

Cost per unit (450) = $5,100 ÷ 450 = $11.33

Cost per unit (600) = $6,600 ÷ 600 = $11.00

c. As the number of returns increased from 200 to 600, the fixed cost of $600 decreased on a per unit basis.

**Exercise 2-2**

a. Variable cost = 

b. Fixed cost using the low point = $100 – ($.40 x 200) = $20

c. Total cost = $.40MH + $20

d. Total cost = .40(650 hrs) + $20 = $280

**Exercise 2-3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | Per Unit |
| Sales revenue |  | $12,000 |  | $6.00 |
| Less variable costs: |  |  |  |  |
| COGS | $3,200 |  |  | 1.60 |
| Operating costs | 1,200a |  |  | .60 |
| Total variable costs |  | 4,400 |  | 2.20 |
| Contribution margin |  | 7,600 |  | $3.80 |
| Fixed operating costs |  | 2,600b |  |  |
| Operating Income |  | $5,000 |  |  |

Units sold = $12,000 sales revenue ÷ $6.00 per unit = 2,000 units

a2,000 units × $0.60 per unit

b$3,800 total operating costs - $1,200 variable cost

**Exercise 2-4**

a.

|  |  |  |
| --- | --- | --- |
|  |  |  |
| Sales revenue |  | $51,000 |
| Less variable costs: |  |  |
| COGS | $24,280 |  |
| Selling (25%) | 2,000a |  |
| Administrative (70%) | 8,400b |  |
| Total variable costs |  | 34,680 |
| Contribution margin |  | 16,320 |
| Less fixed costs: |  |  |
| Selling (75%) | 6,000c |  |
| Administrative (30%) | 3,600d |  |
| Total fixed costs |  | 9,600 |
| Operating Income |  | $6,720 |

a$8,000 × 0.25

b$12,000 × 0.70

c$8,000 × 0.75

d$12,000 × 0.30

b. $51,000 ÷ $1.50 per cookie = 34,000 cookies

c. $16,320 ÷ 34,000 cookies = $.48 per cookie

d. $16,320 ÷ $51,000 = 32%

**SOLUTIONS TO PROBLEMS**

**Problem 2-1**

a.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Minutes |  | Cost per minute |  | Total Cost |
| 10 |  | $6.00 |  | $60 |
| 100 |  | $0.60 |  | $60 |
| 250 |  | $0.24 |  | $60 |
| 500 |  | $0.12 |  | $60 |

b. This is a fixed cost because total cost remains fixed while the cost per minute decreases as minutes used increases.

c. 1,000 × $.03 = $30; prefer $.03 per minute instead of $60 per month

2,800 × $.03 = $84; prefer $60 per month

indifferent where $60 = $.03x

x = 2,000 minutes

**Problem 2-2**

a. Variable cost = 

Fixed cost = $78,000 – ($4.20 x 7,500) = $46,500

b. Total cost = ($4.20 x 2,900) + $46,500 = $58,680

c. Additional overhead = $4.20 x 250 = $1,050

**Problem 2-3**

Sales price = $3,600 ÷ 2,000 windows = $1.80 per window

COGS = $1,300 ÷ 2,000 windows = $.65 per window

Variable salaries = 

Postage = $500 ÷ 2,000 windows = $0.25 per window

Fixed salaries = $1,200 - $0.15(6,000) = $300

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | 4,500 windows |  | Per Unit |
| Sales revenue |  | $8,100 |  | $1.80 |
| Less variable costs: |  |  |  |  |
| COGS | 2,925 |  |  | 0.65 |
| Salaries | 675 |  |  | 0.15 |
| Postage | 1,125 |  |  | 0.25 |
| Total variable costs |  | 4,725 |  | 1.05 |
| Contribution margin |  | 3,375 |  | $0.75 |
| Less fixed costs: |  |  |  |  |
| Advertising | 600 |  |  |  |
| Salaries | 300 |  |  |  |
| Insurance | 300 |  |  |  |
| Total fixed costs |  | 1,200 |  |  |
| Operating income |  | $2,175 |  |  |