

Cost Accounting: A Managerial Emphasis, 16e, Global Edition (Horngren)
Chapter 3 Cost-Volume-Profit Analysis

3.1 Objective 3.1

1) Managers use cost-volume-profit (CVP) analysis to _____.

- A) forecast the cost of capital for a given period of time
- B) to study the behavior of and relationship among the elements such as total revenues, total costs, and income
- C) estimate the risks associated with a given job
- D) analyse a firm's profitability and help to decide wealth distribution among its stakeholders

Answer: B

Diff: 1

Objective: 1

AACSB: Analytical thinking

2) One of the first steps to take when using CVP analysis to help make decisions is _____.

- A) calculating the break-even point
- B) identifying the variable and fixed costs
- C) calculation of the degree of operating leverage for the company
- D) estimating the volume of sales to make a good profit

Answer: B

Diff: 2

Objective: 1

AACSB: Analytical thinking

3) Which of the following is true of cost-volume-profit analysis?

- A) The theory assumes that all costs are variable.
- B) The theory assumes that units manufactured equal units sold.
- C) The theory states that total variable costs remain the same over a relevant range.
- D) The theory states that total costs remain the same over the relevant range.

Answer: B

Diff: 2

Objective: 1

AACSB: Application of knowledge

4) The selling price per unit less the variable cost per unit is the _____.

- A) fixed cost per unit
- B) gross margin
- C) margin of safety
- D) contribution margin per unit

Answer: D

Diff: 1

Objective: 1

AACSB: Analytical thinking

EA

5) In the graph method of CVP analysis, _____.

- A) The total revenue line starts at the origin and the total costs line starts at the fixed intercept.
- B) The operating income line starts at the origin and the total costs line starts at the fixed intercept.
- C) The breakeven point is at the fixed intercept where the total revenues line intersects.
- D) The operating income area is the section where the total costs line is above the total revenues line.

Answer: A

Diff: 2

Objective: 1

AACSB: Analytical thinking

6) Which of the following is an assumption of CVP analysis?

- A) Total costs can be divided into a fixed component and a component that is variable with respect to the level of output.
- B) When graphed, total costs curve upward.
- C) The unit-selling price is variable as it is subject to demand and supply.
- D) Total costs can be divided into inventoriable and period costs with respect to the level of output.

Answer: A

Diff: 2

Objective: 1

AACSB: Analytical thinking

7) Which of the following is true of CVP analysis?

- A) Costs may be separated into separate inventoriable and period components with respect to the level of output.
- B) Total revenues and total costs are linear in relation to output units.
- C) Unit selling price, unit variable costs, and unit fixed costs are known and remain constant.
- D) Proportion of different products will vary according to demand and supply when multiple products are sold.

Answer: B

Diff: 2

Objective: 1

AACSB: Analytical thinking

8) A revenue driver is defined as _____.

- A) any factor that affects costs and revenues
- B) any factor that affects revenues
- C) the only factor that can influence a change in selling price
- D) the only factor that can influence a change in demand

Answer: B

Diff: 1

Objective: 1

AACSB: Analytical thinking

EA

9) The contribution margin per unit equals _____ .

- A) fixed cost - contribution margin ratio
- B) selling price - fixed costs per unit
- C) selling price - variable costs per unit
- D) selling price - costs of goods sold

Answer: C

Diff: 1

Objective: 1

AACSB: Analytical thinking

10) Which of the following is true about the assumptions underlying basic CVP analysis?

- A) Selling price varies with demand and supply of the product.
- B) Only selling price and variable cost per unit are known and constant.
- C) Only selling price, variable cost per unit, and total fixed costs are known and constant.
- D) Selling price, variable cost per unit, fixed cost per unit, and total fixed costs are known and constant.

Answer: C

Diff: 1

Objective: 1

AACSB: Analytical thinking

11) The contribution margin income statement _____.

- A) reports gross margin
- B) is allowed for external reporting to shareholders
- C) categorizes costs as either direct or indirect
- D) can be used to predict operating income at different levels of activity

Answer: D

Diff: 1

Objective: 1

AACSB: Analytical thinking

12) Contribution margin equals _____.

- A) revenues minus period costs
- B) revenues minus product costs
- C) revenues minus variable costs
- D) revenues minus fixed costs

Answer: C

Diff: 1

Objective: 1

AACSB: Analytical thinking

EA

13) Sparkle Jewelry sells 800 units resulting in \$9,000 of sales revenue, \$3,000 of variable costs, and \$1,500 of fixed costs. Contribution margin per unit is _____. (Round the final answer to the nearest cent.)

- A) \$13.75
- B) \$11.25
- C) \$7.50
- D) \$5.00

Answer: C

Explanation: $(\$9,000 - \$3,000) / 800 \text{ units} = \7.50 per unit

Diff: 2

Objective: 1

AACSB: Application of knowledge

14) Sparkle Jewelry sells 500 units resulting in \$10,000 of sales revenue, \$4,000 of variable costs, and \$1,500 of fixed costs. Calculate the variable cost per unit. (Round the final answer to the nearest cent.)

- A) \$12.00
- B) \$6.00
- C) \$2.00
- D) \$8.00

Answer: D

Explanation: $\$4,000 / 500 = \8.00

Diff: 2

Objective: 1

AACSB: Application of knowledge

15) Tally Corp. sells softwares during the recruiting seasons. During the current year, 14,000 software packages were sold resulting in \$460,000 of sales revenue, \$110,000 of variable costs, and \$50,000 of fixed costs.

Contribution margin per software is _____.

- A) \$32.86
- B) \$25.00
- C) \$29.29
- D) \$7.86

Answer: B

Explanation: $(\$460,000 - \$110,000) / 14,000 = \$25.00 \text{ per software}$

Diff: 2

Objective: 1

AACSB: Application of knowledge

EA

16) Tally Corp. sells software during the recruiting seasons. During the current year, 10,000 software packages were sold resulting in \$470,000 of sales revenue, \$130,000 of variable costs, and \$48,000 of fixed costs.

If sales increase by \$80,000, operating income will increase by _____. (Round interim calculations to two decimal places and the final answer to the nearest whole dollar.)

- A) \$30,588
- B) \$32,000
- C) \$48,000
- D) \$57,872

Answer: D

Explanation: Price = $\$470,000 / 10,000 = \47.00

Sales in software packages = $\$80,000 / \$47.00 = 1,702.13$ software packages

Operating income increase = $1,702.13$ software packages \times $\$34.00$ per = $\$57,872$

Diff: 2

Objective: 1

AACSB: Application of knowledge

17) Pacific Company sells only one product for \$12 per unit, variable production costs are \$3 per unit, and selling and administrative costs are \$1.70 per unit. Fixed costs for 11,000 units are \$6,000. The operating income is _____ when 11,000 units are sold.

- A) \$8.45 per unit
- B) \$6.75 per unit
- C) \$7.30 per unit
- D) \$4.70 per unit

Answer: B

Explanation: Operating income = $\$12 - \$3 - \$1.70 - (\$6,000 / 11,000) = \$6.75$

Diff: 2

Objective: 1

AACSB: Application of knowledge

18) The contribution income statement highlights _____.

- A) gross margin
- B) the segregation of costs into period costs and inventoriable costs
- C) different product lines
- D) variable and fixed costs

Answer: D

Diff: 1

Objective: 1

AACSB: Analytical thinking

EA

19) Fixed costs equal \$16,000, unit contribution margin equals \$35, and the number of units sold equal 1,300. Operating income is _____.

- A) \$45,500
- B) \$29,500
- C) \$16,000
- D) \$61,500

Answer: B

Explanation: $(1,300 \times \$35) - \$16,000 = \$29,500$

Diff: 2

Objective: 1

AACSB: Application of knowledge

20) Orion Company sells several products. Information of average revenue and costs is as follows:

Selling price per unit	\$23
Variable costs per unit:	
Direct material	\$4
Direct manufacturing labor	\$1.60
Manufacturing overhead	\$0.40
Selling costs	\$2.10
Annual fixed costs	\$100,000

The company sells 12,000 units at the end of the year.

The contribution margin per unit is _____.

- A) \$16.50
- B) \$14.90
- C) \$18.60
- D) \$19.00

Answer: B

Explanation: Contribution margin per unit = $(\$23 - \$4 - \$1.60 - \$0.40 - \$2.10) = \14.90

Diff: 2

Objective: 1

AACSB: Application of knowledge

EA

21) Orion Company sells several products. Information of average revenue and costs is as follows:

Selling price per unit	\$23
Variable costs per unit:	
Direct material	\$4
Direct manufacturing labor	\$1.70
Manufacturing overhead	\$0.40
Selling costs	\$2
Annual fixed costs	\$100,000

The company sells 12,000 units at the end of the year.

If direct labor and direct material costs increase by \$1 each, contribution margin _____.

A) increases by \$24,000

B) increases by \$12,000

C) decreases by \$24,000

D) decreases by \$12,000

Answer: C

Explanation: Contribution margin = $(\$23 - \$5 - \$2.70 - \$0.40 - \$2) \times 12,000 = \$154,800$.

The previous contribution margin was \$178,800 which means it decreased by \$24,000

Diff: 3

Objective: 1

AACSB: Application of knowledge

22) Bell Company sells several products. Information of average revenue and costs is as follows:

Selling price per unit	\$33.00
Variable costs per unit:	
Direct material	\$6.00
Direct manufacturing labor	\$1.50
Manufacturing overhead	\$0.30
Selling costs	\$2.25
Annual fixed costs	\$113,000

The company sells 10,000 units.

The contribution margin per unit is _____.

A) \$11.65

B) \$22.95

C) \$25.20

D) \$25.50

Answer: B

Explanation: Contribution margin per unit = $\$33.00 - \$6.00 - \$1.50 - \$0.30 - \$2.25 = \22.95

Diff: 2

Objective: 1

AACSB: Application of knowledge

EA

23) Bell Company sells several products. Information of average revenue and costs is as follows:

Selling price per unit	\$29
Variable costs per unit:	
Direct material	\$6
Direct manufacturing labor	\$1.75
Manufacturing overhead	\$0.25
Selling costs	\$2
Annual fixed costs	\$111,000

The company sells 13,000 units.

What is the proportion of variable costs to total costs?

- A) 43.15%
- B) 41.27%
- C) 77.25%
- D) 53.94%

Answer: D

Explanation: Total variable costs = \$6 + \$1.75 + \$0.25 + \$2 = \$10 × 13,000 = \$130,000

Total costs = \$130,000 + \$111,000 = \$241,000.

Variable cost proportion = \$130,000 / \$241,000 = 53.94%

Diff: 2

Objective: 1

AACSB: Application of knowledge

24) Family Furniture sells a table for \$900. Its fixed costs are \$30,000, while its variable costs are \$600 per table. It currently plans to sell 175 tables this month.

What is the budgeted revenue for the month assuming that Family Furniture sells 175 tables?

- A) \$52,500
- B) \$157,500
- C) \$127,500
- D) \$105,000

Answer: B

Explanation: Budgeted revenue = 175 × \$900 = \$157,500

Diff: 2

Objective: 1

AACSB: Application of knowledge

EA

25) Family Furniture sells a table for \$950. Its fixed costs are \$2,500, while its variable costs are \$500 per table. It currently plans to sell 180 tables this month.

What is the budgeted operating income for the month assuming that Family Furniture sells 180 tables?

- A) \$168,500
- B) \$81,000
- C) \$78,500
- D) \$171,000

Answer: C

Explanation: Budgeted operating income = $\$171,000 - [(180 \times \$500) + \$2,500] = \$171,000 - \$92,500 = \$78,500$

Diff: 2

Objective: 1

AACSB: Application of knowledge

26) SaleCo sells 8,400 units resulting in \$120,000 of sales revenue, \$35,000 of variable costs, and \$45,000 of fixed costs. The contribution margin percentage is _____.

- A) 62.5%
- B) 70.83%
- C) 33.33%
- D) 29.17%

Answer: B

Explanation: $(\$120,000 - \$35,000) / \$120,000 = 70.83\%$

Diff: 2

Objective: 1

AACSB: Application of knowledge

27) Which of the following is the mathematical expression of contribution margin ratio?

- A) Contribution margin ratio = Contribution margin percentage \times Revenues (in dollars)
- B) Contribution margin ratio = Contribution margin percentage \times Fixed costs (in dollars)
- C) Contribution margin ratio = Contribution margin percentage \times Variable costs (in dollars)
- D) Contribution margin ratio = Contribution margin percentage \times Operating leverage

Answer: A

Diff: 1

Objective: 1

AACSB: Analytical thinking

28) Contribution Margin = Total revenues - Total variable costs

Answer: TRUE

Diff: 1

Objective: 1

AACSB: Analytical thinking

29) Contribution margin = Total revenues - Total manufacturing costs

Answer: FALSE

Explanation: Gross Margin = Total revenues - Total manufacturing costs OR

Contribution Margin = Total Revenue - Total variable costs

Diff: 1

Objective: 1

AACSB: Analytical thinking

EA

30) Contribution margin percentage = Selling price - Variable cost per unit

Answer: FALSE

Explanation: Contribution margin percentage = $\frac{\text{Contribution margin}}{\text{revenues}}$ OR
 $\frac{\text{Contribution margin per unit}}{\text{Selling price - Variable cost per unit}}$

Diff: 1

Objective: 1

AACSB: Analytical thinking

31) Contribution margin per unit equals contribution margin divided by number of units sold.

Answer: TRUE

Diff: 2

Objective: 1

AACSB: Analytical thinking

32) In CVP analysis, the graph of total revenues versus total costs is linear in nature relation to units sold within a relevant range and time period.

Answer: TRUE

Diff: 1

Objective: 1

AACSB: Analytical thinking

33) The difference between total revenues and total variable costs is called profit margin.

Answer: FALSE

Explanation: The difference between total revenues and total variable costs is called contribution margin.

Diff: 2

Objective: 1

AACSB: Analytical thinking

34) The shorter the time horizon, the lower the percentage of total costs considered fixed.

Answer: FALSE

Explanation: The shorter the time horizon, the higher the percentage of total costs considered fixed.

Diff: 2

Objective: 1

AACSB: Analytical thinking

35) The three methods used to study CVP analysis are graph method, contribution method, and equation method.

Answer: TRUE

Diff: 1

Objective: 1

AACSB: Analytical thinking

36) Contribution margin = Contribution margin percentage × Revenues (in dollars).

Answer: TRUE

Diff: 1

Objective: 1

AACSB: Analytical thinking

EA

37) A revenue driver is a variable, such as volume, that causally affects revenues.

Answer: TRUE

Diff: 1

Objective: 1

AACSB: Analytical thinking

38) Operating income plus total fixed costs equals the contribution margin.

Answer: TRUE

Explanation: Total revenues less total variable costs equal the contribution margin.

Diff: 2

Objective: 1

AACSB: Analytical thinking

39) Contribution margin percentage equals the unit contribution margin divided by the selling price.

Answer: TRUE

Explanation: Contribution margin per unit divided by selling price per unit equals contribution margin percentage.

Diff: 1

Objective: 1

AACSB: Analytical thinking

40) The classification of costs as variable and fixed depends on the relevant range, the length of the time horizon, and the specific decision situation.

Answer: TRUE

Diff: 2

Objective: 1

AACSB: Analytical thinking

41) The difference between total revenues and total variable costs is called contribution margin.

Answer: TRUE

Diff: 1

Objective: 1

AACSB: Analytical thinking

42) Only variable production costs are used when calculating contribution margin.

Answer: FALSE

Explanation: False because all variable costs, production and selling/admin, are subtracted from revenue to determine contribution margin.

Diff: 2

Objective: 1

AACSB: Analytical thinking

43) Arthur's Plumbing reported the following:

Revenues	\$4,500
Variable manufacturing costs	\$ 900
Variable nonmanufacturing costs	\$ 810
Fixed manufacturing costs	\$ 630
Fixed nonmanufacturing costs	\$ 545

Required:

- Compute contribution margin.
- Compute contribution margin percentage.
- Compute gross margin.
- Compute gross margin percentage.
- Compute operating income.

Answer:

- Contribution margin $\$4,500 - \$900 - \$810 = \$2,790$
- Contribution margin percentage $= (\$2,790/\$4,500) \times 100 = 62\%$
- Gross margin $\$4,500 - \$900 - \$630 = \$2,970$
- Gross margin percentage $= (\$2,970/\$4,500) \times 100 = 66\%$
- Operating income $\$4,500 - \$900 - \$810 - \$630 - \$545 = \$1,615$

Diff: 3

Objective: 1

AACSB: Application of knowledge

3.2 Objective 3.2

1) SaleCo sells 11,000 units resulting in \$110,000 of sales revenue, \$50,000 of variable costs, and \$45,000 of fixed costs. To achieve \$150,000 in operating income, sales must total _____. (Round intermediate calculations to two decimal places and the final answer to the nearest dollar.)

- \$245,000
- \$253,846
- \$160,000
- \$357,500

Answer: D

Explanation: $((110,000 - 50,000) / 110,000) = 55\%$

$(\$150,000 + \$45,000) / 55\% = \$357,500$ in sales

Diff: 2

Objective: 2

AACSB: Application of knowledge

EA

2) Sparkle Jewelry sells 600 units resulting in \$75,000 of sales revenue, \$32,000 of variable costs, and \$26,000 of fixed costs.

Breakeven point in units is _____. (Round to the nearest whole unit.)

- A) 447 units
- B) 684 units
- C) 810 units
- D) 363 units

Answer: D

Explanation: Contribution margin per unit = $(\$75,000 - \$32,000) / 600 = \$71.67$

Breakeven point = $\$26,000 / \$71.67 = 363$ units.

Diff: 2

Objective: 2

AACSB: Application of knowledge

3) Sparkle Jewelry sells 800 units resulting in \$85,000 of sales revenue, \$32,000 of variable costs, and \$26,000 of fixed costs.

The number of units that must be sold to achieve \$41,000 of operating income is _____.

- A) 909 units
- B) 393 units
- C) 1,012 units
- D) 619 units

Answer: C

Explanation: $(\$85,000 - \$32,000) / 800 = \$66.25$

The number of units that must be sold to achieve \$41,000 of operating income = $(\$26,000 + \$41,000) / \$66.25 = 1,012$ units

Diff: 2

Objective: 2

AACSB: Application of knowledge

4) Sky High sells helicopters. During the current year, 130 helicopters were sold resulting in \$820,000 of sales revenue, \$250,000 of variable costs, and \$345,000 of fixed costs. Breakeven point in units is _____.

- A) 95 units
- B) 58 units
- C) 79 units
- D) 55 units

Answer: C

Explanation: Contribution margin per unit = $(\$820,000 - \$250,000) / 130 = \$570,000 / 130 = \$4,384.62$ per unit.

Breakeven point = $\$345,000 / \$4,384.62 = 79$ units

Diff: 2

Objective: 2

AACSB: Application of knowledge

EA

5) Sky High sells helicopters. During the current year, 130 helicopters were sold resulting in \$840,000 of sales revenue, \$260,000 of variable costs, and \$350,000 of fixed costs. The number of helicopters that must be sold to achieve \$320,000 of operating income is _____.

- A) 151 units
- B) 104 units
- C) 79 units
- D) 130 units

Answer: A

Explanation: Number of helicopters to be sold to achieve an operating income of \$320,000 = $(\$350,000 + \$320,000) / \$4,461.54 = 151$ units

Diff: 2

Objective: 2

AACSB: Application of knowledge

6) The controller at TellCo is examining her books. She determines that at the breakeven point of 5,000 units, variable costs total \$4,000 and fixed costs total \$7,000. Therefore, 5,001st unit sold will contribute _____ to profits. (Round the final answer to the nearest cent.)

- A) \$0.80
- B) \$0.60
- C) \$1.40
- D) \$2.20

Answer: C

Explanation: Fixed costs of \$7,000/5,000 units = Contribution Margin of \$1.40 per unit.

Diff: 2

Objective: 2

AACSB: Application of knowledge

7) The breakeven point is the activity level where _____.

- A) revenues equal fixed costs
- B) revenues equal variable costs
- C) contribution margin equals total costs
- D) revenues equal the sum of variable and fixed costs

Answer: D

Explanation: Revenue - Variable Costs - Fixed Costs = Operating income, thus;

Revenue = Variable Costs + Fixed Costs

Diff: 1

Objective: 2

AACSB: Analytical thinking

8) Breakeven point in units is _____.

- A) total costs divided by profit margin per unit
- B) contribution margin per unit divided by total cost per unit
- C) fixed costs divided by contribution margin per unit
- D) the sum of fixed and variable costs divided by contribution margin per unit

Answer: C

Diff: 1

Objective: 2

AACSB: Analytical thinking

EA

9) Sales total \$400,000 when variable costs total \$300,000 and fixed costs total \$80,000. The breakeven point in sales dollars is _____. (Round interim calculations to two decimal places and the final answer to the nearest dollar.)

- A) \$320,000
- B) \$400,000
- C) \$1,200,000
- D) \$500,000

Answer: A

Explanation: Contribution margin percentage = $(\$400,000 - \$300,000) / \$400,000 = 25\%$;

BE sales = $\$80,000 / 0.25 = \$320,000$

Diff: 3

Objective: 2

AACSB: Application of knowledge

10) The breakeven point revenues is calculated by dividing _____.

- A) fixed costs by total revenues
- B) fixed costs by contribution margin percentage
- C) total revenues by fixed costs
- D) contribution margin percentage by fixed costs

Answer: B

Diff: 2

Objective: 2

AACSB: Analytical thinking

11) At breakeven point, _____.

- A) operating income is equal to zero
- B) contribution margin minus fixed costs is equal to profits earned
- C) revenues equal fixed costs minus variable costs
- D) breakeven revenues equal fixed costs divided by the variable cost per unit

Answer: A

Diff: 2

Objective: 2

AACSB: Analytical thinking

12) The breakeven point decreases if _____.

- A) the variable cost per unit increases
- B) the total fixed costs decrease
- C) the contribution margin per unit decreases
- D) the selling price per unit decreases

Answer: B

Diff: 2

Objective: 2

AACSB: Analytical thinking

EA

13) Assume only the specified parameters change in a CVP analysis. The contribution margin percentage increases when _____.

- A) total fixed costs increase
- B) total fixed costs decrease
- C) variable costs per unit increase
- D) variable costs per unit decrease

Answer: D

Diff: 1

Objective: 2

AACSB: Analytical thinking

14) What is the breakeven point in units, assuming a product's selling price is \$300, fixed costs are \$18,000, unit variable costs are \$20, and operating income is \$6,000?

- A) 22 units
- B) 86 units
- C) 60 units
- D) 65 units

Answer: D

Explanation: Unit contribution margin = $\$300 - \$20 = \$280$.

Breakeven point in units = $\$18,000 / \$280 = 65$ units

Diff: 2

Objective: 2

AACSB: Application of knowledge

15) Rosewood company sells wooden carvings for \$300 each. The direct materials cost per unit is \$160 and the direct labor is 2 hours at a rate of \$26 per hour. Manufacturing overhead is applied on the basis of labor hours at a rate of \$36 per hour. Rosewood makes and sells 1,000 units per period. How many units must Rosewood sell to breakeven?

- A) 409 units
- B) 450 units
- C) 240 units
- D) 818 units

Answer: D

Explanation: Correct. Unit Contribution Margin $300 - 160 - (2 \times \$26) = \88

Fixed cost per period = $(2 \times \$36) \times 1,000$ units = \$72,000

Breakeven = $FC / CM = \$72,000 / \$88 = 818$ units

Diff: 3

Objective: 2

AACSB: Application of knowledge

16) If unit outputs exceed the breakeven point _____.

- A) there will be an increase in fixed costs
- B) total sales revenue will exceed fixed costs
- C) total sales revenue will exceed variable costs
- D) there will be a profit

Answer: D

Diff: 2

Objective: 2

AACSB: Analytical thinking

EA

17) Firebird Ltd. sells packaged birdseed for \$6.00 per package. Variable product costs are \$3.00 per package. Fixed costs are \$12,000 per period. How many packages must Firebird sell to earn a target operating income of \$7,900?

- A) 4,000 packages
- B) 2,633 packages
- C) 6,633 packages
- D) 3,317 packages

Answer: C

Explanation: Correct. Quantity required = (fixed costs + target OpInc) / CM per unit

$$Q = (\$12,000 + \$7,900) / (\$6.00 - \$3.00) = 6,633 \text{ units.}$$

Diff: 3

Objective: 2

AACSB: Application of knowledge

18) How many units would have to be sold to yield a target operating income of \$26,000, assuming variable costs are \$27 per unit, total fixed costs are \$2,000, and the unit selling price is \$32?

- A) 400 units
- B) 1,038 units
- C) 5,600 units
- D) 1,273 units

Answer: C

Explanation: Desired sales = $(\$2,000 + \$26,000) / (\$32 - \$27) = 5,600$ units

Diff: 3

Objective: 2

AACSB: Application of knowledge

19) If the breakeven point is 1,300 units and each unit sells for \$50, then _____.

- A) selling 1,340 units will result in a loss
- B) selling \$85,000 will result in a loss
- C) selling \$65,000 will result in zero profit
- D) selling \$58,000 will result in profit

Answer: C

Explanation: $1,300 \times \$50 = \$65,000$ of BE sales

Diff: 2

Objective: 2

AACSB: Application of knowledge

20) Slickware sells porcelain cups. The breakeven point is 5,000 units. The variable cost per unit is \$18 and the fixed costs are \$20,000. What is the contribution margin at 5,000 units?

- A) 20,000
- B) 90,000
- C) 110,000
- D) 40,000

Answer: A

Explanation: Correct. The contribution margin equals fixed costs at breakeven.

Diff: 3

Objective: 2

AACSB: Application of knowledge

EA

21) Slickware sells porcelain cups. The breakeven point is 5,000 units. The variable cost per unit is \$12 and the fixed costs are \$20,000. What is the selling price?

- A) \$16
- B) \$24
- C) \$28
- D) \$20

Answer: A

Explanation: Correct. The contribution margin equals fixed costs at breakeven.

Therefore $\$20,000 / 5,000 \text{ units} = \4 CM per unit . $VC = \$12$ so selling price must be \$16.

Diff: 3

Objective: 2

AACSB: Application of knowledge

22) If breakeven point is 1,000 units, each unit sells for \$31, and fixed costs are \$30,000, then on a graph the _____.

- A) total revenue line and the total cost line will intersect at \$31,000 of revenue
- B) total cost line will be zero at zero units sold
- C) revenue line will start at \$30,000
- D) total revenue line and the total cost line will intersect at \$61,000 of revenue

Answer: A

Explanation: $\$(1,000 \times 31) = \$31,000$

Diff: 3

Objective: 2

AACSB: Application of knowledge

23) When fixed costs are \$70,000 and variable costs are 60% of the selling price, then breakeven sales are _____. (Round the final answer to the nearest dollar.)

- A) \$116,667
- B) \$175,000
- C) \$112,000
- D) \$98,000

Answer: B

Explanation: $\$70,000 / (1 - 0.6) = \$175,000$ in BE sales

Diff: 2

Objective: 2

AACSB: Application of knowledge

24) Ruben is a travel agent. He intends to sell his customers a special round-trip airline ticket package. He is able to purchase the package from the airline for \$170 each. The round-trip tickets will be sold for \$200 each and the airline intends to reimburse Ruben for any unsold ticket packages. Fixed costs include \$5,500 in advertising costs. What is the contribution margin per ticket package?

- A) \$30
- B) \$370
- C) \$170
- D) \$200

Answer: A

Explanation: $\$200 - \$170 = \$30$

Diff: 2

Objective: 2

AACSB: Application of knowledge

EA

25) Ruben is a travel agent. He intends to sell his customers a special round-trip airline ticket package. He is able to purchase the package from the airline for \$160 each. The round-trip tickets will be sold for \$200 each and the airline intends to reimburse Ruben for any unsold ticket packages. Fixed costs include \$5,200 in advertising costs. How many ticket packages will Ruben need to sell to break even?

- A) 26 packages
- B) 40 packages
- C) 130 packages
- D) 160 packages

Answer: C

Explanation: $\$200X - \$160X - \$5,200 = 0$; $X = 130$

Diff: 2

Objective: 2

AACSB: Application of knowledge

26) Ruben is a travel agent. He intends to sell his customers a special round-trip airline ticket package. He is able to purchase the package from the airline for \$140 each. The round-trip tickets will be sold for \$230 each and the airline intends to reimburse Ruben for any unsold ticket packages. Fixed costs include \$5,500 in advertising costs. How many ticket packages will Ruben need to sell in order to achieve \$60,000 of operating income?

- A) 62 packages
- B) 667 packages
- C) 285 packages
- D) 728 packages

Answer: D

Explanation: $\$230X - \$140X - \$5,500 = \$60,000$; $X = 728$

Diff: 2

Objective: 2

AACSB: Application of knowledge

27) Ruben intends to sell his customers a special round-trip airline ticket package. He is able to purchase the package from the airline carrier for \$170 each. The round-trip tickets will be sold for \$200 each and the airline intends to reimburse Ruben for any unsold ticket packages. Fixed costs include \$5,140 in advertising costs. For every \$27,000 of ticket packages sold, operating income will increase by _____.

- A) \$4,050
- B) \$34,000
- C) \$22,950
- D) \$27,000

Answer: A

Explanation: $\$27,000 \times [(\$200 - \$170 / \$200)] = \$4,050$

Diff: 3

Objective: 2

AACSB: Application of knowledge

EA

28) Quality Stores, Inc., sells several products. Information of average revenue and costs is as follows:

Selling price per unit	\$20
Variable costs per unit:	
Direct material	\$4
Direct manufacturing labor	\$1.80
Manufacturing overhead	\$0.4
Selling costs	\$3
Annual fixed costs	\$96,000

What is the contribution margin percentage? (Round your answer to the nearest whole percent.)

- A) 54%
- B) 69%
- C) 43%
- D) 47%

Answer: A

Explanation: Contribution margin percentage = $(\$20 - \$4 - \$1.80 - \$0.4 - \$3) / 20 = 54\%$

Diff: 2

Objective: 2

AACSB: Application of knowledge

29) Quality Stores, Inc., sells several products. Information of average revenue and costs is as follows:

Selling price per unit	\$23
Variable costs per unit:	
Direct material	\$6
Direct manufacturing labor	\$1.90
Manufacturing overhead	\$0.40
Selling costs	\$2
Annual fixed costs	\$96,000

The revenues that the company must earn annually to make a profit of \$144,000 are _____. (Round the final answer to the nearest dollar.)

- A) \$375,510
- B) \$365,563
- C) \$434,646
- D) \$324,706

Answer: C

Explanation: Desired sales = $(\$96,000 + \$144,000) / 0.55 = \$434,646$

Diff: 2

Objective: 2

AACSB: Application of knowledge

EA

30) Frazer Corp sells several products. Information of average revenue and costs is as follows:

Selling price per unit	\$28.5
Variable costs per unit:	
Direct material	\$6.00
Direct manufacturing labor	\$1.45
Manufacturing overhead	\$0.85
Selling costs	\$2.60
Annual fixed costs	\$125,000

What is the operating income earned if the company sells 20,000 units?

- A) \$279,000
- B) \$296,000
- C) \$325,000
- D) \$227,000

Answer: D

Explanation: Contribution = $\$28.5 - \$6.00 - \$1.45 - \$0.85 - \$2.60 = \$17.6 \times 20,000 = \$352,000$

Operating income = $\$352,000 - \$125,000 = \$227,000$

Diff: 2

Objective: 2

AACSB: Application of knowledge

31) Frazer Corp sells several products. Information of average revenue and costs is as follows:

Selling price per unit	\$28.50
Variable costs per unit:	
Direct material	\$6.00
Direct manufacturing labor	\$1.45
Manufacturing overhead	\$0.85
Selling costs	\$2.50
Annual fixed costs	\$135,000

If the company decides to lower its selling price by 14.25%, but continues to sell 16,000 units, the operating income is reduced by _____.

- A) \$64,960
- B) \$135,000
- C) \$13,200
- D) \$16,000

Answer: A

Explanation: $\$28.50 \times 14.25\% = 4.06$. Therefore the new selling price is \$24.44 ($\$28.50 - \4.06).

Contribution = $(\$24.44 - \$6.00 - \$1.45 - \$0.85 - \$2.50) \times 16,000 = \$218,240$

Operating income = $\$218,240 - \$135,000 = \$83,240$.

Diff: 3

Objective: 2

AACSB: Application of knowledge

EA

32) The following information is for High Corp:

Selling price	\$60 per unit
Variable costs	\$40 per unit
Total fixed costs	\$135,000

The number of units that High Corp must sell to reach targeted operating income of \$25,000 is _____.
(Round up to the nearest unit.)

- A) 6,750 units
- B) 8,000 units
- C) 1,250 units
- D) 2,667 units

Answer: B

Explanation: $(\$135,000 + \$25,000) / (\$60 - \$40) = 8,000$ units

Diff: 2

Objective: 2

AACSB: Application of knowledge

33) The following information is for High Corp:

Selling price	\$60 per unit
Variable costs	\$40 per unit
Total fixed costs	\$130,000

If targeted operating income is \$50,000, then targeted sales revenue is _____. (Round the final answer to the nearest dollar.)

- A) \$540,000
- B) \$390,000
- C) \$150,000
- D) \$180,000

Answer: A

Explanation: $(\$130,000 + \$50,000) / [(\$60 - \$40) / \$60] = \$540,000$

Diff: 2

Objective: 2

AACSB: Application of knowledge

34) Katrina's Bridal Shoppe sells wedding dresses. The average selling price of each dress is \$1,200, variable costs are \$400, and fixed costs are \$110,000. What is Katrina's operating income when 200 dresses are sold?

- A) \$50,000
- B) \$240,000
- C) \$80,000
- D) \$130,000

Answer: A

Explanation: $200(\$1,200) - 200(\$400) - \$110,000 = \$50,000$

Diff: 2

Objective: 2

AACSB: Application of knowledge

EA

35) Katrina's Bridal Shoppe sells wedding dresses. The average selling price of each dress is \$1,100, variable costs are \$500, and fixed costs are \$100,000. How many dresses are sold when operating income is zero?

- A) 200 dresses
- B) 167 dresses
- C) 310 dresses
- D) 91 dresses

Answer: B

Explanation: $\$1,100N - \$500N - \$100,000 = 0$; $\$600N = \$100,000$; $N = 167$ dresses

Diff: 3

Objective: 2

AACSB: Application of knowledge

36) Dr. Charles Hunter, MD, performs a certain outpatient procedure for \$1,300. His fixed costs are \$24,000 per month and his variable costs are \$500 per procedure. Dr. Hunter currently plans to perform 400 procedures this month. What is the breakeven point for the month assuming that Dr. Hunter plans to perform the procedure 400 times?

- A) 30 times
- B) 19 times
- C) 28 times
- D) 10 times

Answer: A

Explanation: $\$1,300N - \$500N - \$24,000 = 0$; $\$500N = \$24,000$; $N = 30$ times

Diff: 3

Objective: 2

AACSB: Application of knowledge

37) Zirconia Fantasy sells only necklaces. 11,000 units were sold resulting in \$270,000 of sales revenue, \$80,000 of variable costs, and \$40,000 of fixed costs. The breakeven point in total sales dollars is _____.

- A) \$40,000
- B) \$56,843
- C) \$120,000
- D) \$72,000

Answer: B

Explanation: $\$40,000 / (\$270,000 - 80,000) \times 270,000 = \$56,843$ (rounded up)

Diff: 2

Objective: 2

AACSB: Application of knowledge

EA

38) Burgandy Manufacturing produces a single product that sells for \$80. Variable costs per unit equal \$35. The company expects total fixed costs to be \$90,000 for the next month at the projected sales level of 2,500 units. In an attempt to improve performance, management is considering a number of alternative actions. Each situation is to be evaluated separately. What is the current breakeven point in terms of number of units?

- A) 2,000 units
- B) 1,125 units
- C) 2,572 units
- D) 2,046 units

Answer: A

Explanation: $\$80X - \$35X - \$90,000 = 0$; $X = 2,000$ units

Diff: 2

Objective: 2

AACSB: Application of knowledge

39) Lights Manufacturing produces a single product that sells for \$130. Variable costs per unit equal \$55. The company expects total fixed costs to be \$100,000 for the next month at the projected sales level of 1,300 units. What is the current breakeven point in terms of number of units?

- A) 770 units
- B) 1,819 units
- C) 541 units
- D) 1,334 units

Answer: D

Explanation: $\$100,000 / (\$130 - \$55) = 1,334$ units

Diff: 2

Objective: 2

AACSB: Application of knowledge

40) Which of the following will increase a company's breakeven point?

- A) increasing variable cost per unit
- B) increasing contribution margin per unit
- C) reducing its total fixed costs
- D) increasing the selling price per unit

Answer: A

Diff: 1

Objective: 2

AACSB: Analytical thinking

41) The breakeven point is _____.

- A) where selling one more unit will not increase income
- B) where contribution margin equals fixed costs
- C) where total revenues equal contribution margin
- D) fixed costs divided by revenues equals zero

Answer: B

Diff: 2

Objective: 2

AACSB: Analytical thinking

EA

42) You can find the breakeven revenues using total revenues, total variable costs, and total fixed costs; you don't need unit prices and costs.

Answer: TRUE

Explanation: Revenues needed to earn target operating income = $(\text{Fixed costs} + \text{Target OpInc}) / \text{Contribution Margin Percentage}$

Diff: 2

Objective: 2

AACSB: Analytical thinking

43) In the graph method of CVP analysis, the horizontal line above the x -axis represents the total cost line.

Answer: FALSE

Explanation: In the graph method of CVP analysis, the horizontal line above the x -axis represents the fixed cost line.

Diff: 2

Objective: 2

AACSB: Analytical thinking

44) A profit-volume graph shows the impact on operating income from changes in the output level.

Answer: TRUE

Diff: 1

Objective: 2

AACSB: Analytical thinking

45) In the profit-volume graph the point at which the profit-volume line and x -axis intersect is the breakeven point.

Answer: TRUE

Diff: 1

Objective: 2

AACSB: Analytical thinking

46) MyArt sells framed art prints for \$100. The unit variable cost per print is \$50 plus a selling commission of 10%. Fixed manufacturing costs total \$1,250 per month, while fixed selling and administrative costs total \$2,500.

Required:

- a. What is the contribution margin per print?
- b. What is the breakeven point in prints?
- c. How many prints must be sold to earn pretax income of \$7,500?

Answer:

a. $CM \text{ per print} = \$100 - \$50 - 0.1(\$100) = \40

- b. $N = \text{Breakeven in prints}$

$$\$100N - \$50N - \$10N - \$1,250 - \$2,500 = 0$$

$$\$40N - \$3,750 = 0$$

$$N = \$3,750 / \$40 = 93.75 \text{ prints}$$

Breakeven is 94 prints

- c. $N = \text{Prints to be sold}$

$$\$100N - \$50N - \$10N - \$1,250 - \$2,500 = \$7,500$$

$$\$40N = \$11,250$$

$$N = \$11,250 / \$40 = 281.25 \text{ prints}$$

282 prints must be sold

Diff: 3

Objective: 2

AACSB: Application of knowledge

47) What is meant by the term breakeven point? Why should a manager be concerned about the breakeven point and what helps them study the breakeven analysis?

Answer: The breakeven point is the level of production and sales at which total revenues equal total costs. Managers should be concerned about the breakeven point because it helps determine when a business venture will be profitable. Breakeven point shows a company how far sales can decline before a net loss will be incurred. It helps to assess the risk of loss. The graph method helps managers visualize the relationships between total revenues and total costs. The graph shows each relationship as a line.

Diff: 2

Objective: 2

AACSB: Analytical thinking

3.3 Objective 3.3

1) Stephanie's Bridal Shoppe sells wedding dresses. The average selling price of each dress is \$1,200, variable costs are \$700, and fixed costs are \$100,000. How many dresses must the Bridal Shoppe sell to yield after-tax net income of \$20,000, assuming the tax rate is 40%?

- A) 267 dresses
- B) 240 dresses
- C) 200 dresses
- D) 400 dresses

Answer: A

Explanation: $1,200N - \$700N - \$100,000 = \$20,000 / (1 - 0.4)$; $500N - \$100,000 = \$33,333$; $N = 267$ units

Diff: 3

Objective: 3

AACSB: Analytical thinking

2) Anglico's most recent income statement is given below.

Sales (8,000 units)	\$160,000
Less variable expenses	(68,000)
Contribution margin	92,000
Less fixed expenses	<u>(50,000)</u>
Net income	\$42,000

Required:

- a. Contribution margin per unit is \$ _____ per unit
- b. If sales are doubled total variable costs will equal \$ _____
- c. If sales are doubled total fixed costs will equal \$ _____
- d. If 20 more units are sold, profits will increase by \$ _____
- e. Compute how many units must be sold to break even. # _____
- f. Compute how many units must be sold to achieve operating income of \$60,000. # _____
- g. Compute the revenue needed to achieve an after tax income of \$30,000 given a tax rate of 30%. \$ _____

EA

Answer:

- a. Contribution margin per unit is $\$92,000 / 8,000 = \11.5
- b. Variable cost = $\$68,000 \times 2 = \$136,000$
- c. Fixed cost = $\$50,000$
- d. Contribution margin of $\$11.50 \times 20$ units = $\$230$
- e. Breakeven point in units = Fixed costs of $\$50,000 /$ Contribution margin per unit $\$11.50 = 4,348$ units (rounded up)
- f. Desired sales = (Fixed costs of $\$50,000 +$ Desired operating income $\$60,000) / \$11.50 = 9,566$ units (rounded up)
- g. After tax income of $\$35,000 / (1-30\%) =$ operating income of $\$50,000$. Contribution margin ratio = $\$92,000 / \$160,000 = 56.25\%$. Desired sales = (fixed costs of $\$50,000 +$ desired operating income of $\$50,000) / 56.25\% = \$177,778$ (rounded up)

Diff: 3

Objective: 3

AACSB: Application of knowledge

3) Black Pearl, Inc., sells a single product. The company's most recent income statement is given below.

Sales	\$50,000
Less variable expenses	<u>(30,000)</u>
Contribution margin	20,000
Less fixed expenses	<u>(12,500)</u>
Net income	<u>\$ 7,500</u>

Required:

- a. Contribution margin ratio is _____%
- b. Breakeven point in total sales dollars is \$ _____
- c. To achieve \$40,000 in operating income, sales must total \$ _____
- d. If sales increase by \$50,000, operating income will increase by \$ _____
- e. To achieve a \$40,000 after tax income, given a tax rate of 20%, sales must total \$ _____

Answer:

- a. Contribution margin ratio is $\$20,000 / \$50,000 = 40\%$
- b. Fixed costs $\$12,500 / 0.40$ CM% = $\$31,250$ in sales
- c. $[\text{Fixed costs } \$12,500 + \text{operating income } \$40,000] / 0.40$ CM% = $\$131,250$ in sales
- d. $\$50,000 \times 0.40$ CM% = $\$20,000$ increase in net income
- e. After tax income of $\$40,000 / (1-20\%) =$ operating income of $\$50,000$. Desired sales = (fixed costs of $\$12,500 +$ desired operating income of $\$50,000) /$ CM% of $40\% = \$156,250$

Diff: 3

Objective: 3

AACSB: Application of knowledge

EA

4) The selling price per unit is \$25, variable cost per unit \$15, and fixed cost per unit is \$4 when sales are 10,000 units. If one more unit is sold, operating income will increase by \$6.

Answer: FALSE

Explanation: The sale of one more unit will increase net income by \$10, ($\$25 - \$15 = \10).

Diff: 2

Objective: 3

AACSB: Application of knowledge

5) A company with sales of \$50,000, a contribution margin ratio of 30%, and fixed costs of \$25,000 will earn a net income of \$10,000.

Answer: FALSE

Explanation: Net income = $\$50,000 - \$35,000 - \$25,000 = (\$10,000)$

Diff: 2

Objective: 3

AACSB: Application of knowledge

6) Which of the following statements about net income (NI) is true?

A) NI = operating income plus nonoperating revenue.

B) NI = operating income plus operating costs.

C) NI = operating income less income taxes.

D) NI = operating income less cost of goods sold.

Answer: C

Diff: 1

Objective: 3

AACSB: Analytical thinking

7) Assume the following cost information for Fernandez Company:

Selling price	\$180 per unit
Variable costs	\$60 per unit
Total fixed costs	\$90,000
Tax rate	40%

What minimum volume of sales dollars is required to earn an after-tax net income of \$40,000? (Do not round interim calculations and round the final answer to the nearest dollar.)

A) \$135,000

B) \$100,000

C) \$235,000

D) \$225,000

Answer: C

Explanation: Minimum volume of sales dollars is required = $[\$90,000 + (\$40,000 / 0.6)] / [(\$180 - \$60) / \$180] = \$235,000$

Diff: 3

Objective: 3

AACSB: Application of knowledge

EA

8) Assume the following cost information for Fernandez Company:

Selling price	\$200 per unit
Variable costs	\$60 per unit
Total fixed costs	\$80,000
Tax rate	30%

What is the number of units that must be sold to earn an after-tax net income of \$50,000? (Do not round interim calculations and round the final answer to the nearest unit.)

- A) 1,082 units
- B) 929 units
- C) 650 units
- D) 817 units

Answer: A

Explanation: Required number of units = $[\$80,000 + (\$50,000 / 0.7)] / (\$200 - \$60) = 1,082$ units

Diff: 3

Objective: 3

AACSB: Application of knowledge

9) In CVP analysis, focusing on target net income rather than operating income _____.

- A) will increase the breakeven point
- B) will decrease the breakeven point
- C) will not change the breakeven point
- D) will help managers construct a better capital policy

Answer: C

Diff: 2

Objective: 3

AACSB: Analytical thinking

10) Which of the following is true of net income?

- A) Net income is operating income divided by income tax rate.
- B) Net income is operating income plus operating revenues minus operating costs minus income taxes.
- C) Net income is operating income plus nonoperating revenues minus nonoperating costs minus income taxes.
- D) Net income is operating income minus nonoperating revenues minus nonoperating costs minus sales taxes.

Answer: C

Diff: 2

Objective: 3

AACSB: Analytical thinking

EA

11) If selling price per unit is \$55, variable costs per unit are \$25, total fixed costs are \$24,000, the tax rate is 35%, and the company sells 7,000 units, net income is _____.

- A) \$186,000
- B) \$75,250
- C) \$136,500
- D) \$120,900

Answer: D

Explanation: Net income = $[((\$55 - \$25) \times 7,000) - \$24,000] \times (1.0 - 0.35) = \$120,900$

Diff: 2

Objective: 3

AACSB: Application of knowledge

12) The planned operating income is calculated by _____.

- A) dividing net income by tax rate
- B) dividing net income by 1 - tax rate
- C) multiplying net income by tax rate
- D) multiplying net income by 1 - tax rate

Answer: B

Diff: 2

Objective: 3

AACSB: Analytical thinking

13) If Beta Corp's net income is \$230,000 and the tax rate is 40%, then the company's planned operating income is _____.

- A) \$322,000
- B) \$383,333
- C) \$193,200
- D) \$552,000

Answer: B

Explanation: Operating income = $\$230,000 / (0.6) = \$383,333$

Diff: 2

Objective: 3

AACSB: Application of knowledge

14) The Marietta Company has fixed costs of \$75,000 and variable costs are 75% of the selling price. To realize operating income of \$10,000 from sales of 80,000 units, the selling price per unit _____. (Round the answer to the nearest cent.)

- A) must be \$1.06
- B) must be \$1.42
- C) must be \$4.25
- D) must be \$3.75

Answer: C

Explanation: Breakeven sales = $(\$75,000 + \$10,000) / 0.25 = \$340,000$

Selling price = $\$340,000 / 80,000 \text{ units} = \4.25 per unit

Diff: 3

Objective: 3

AACSB: Application of knowledge

15) An increase in the tax rate will increase the breakeven point.

Answer: FALSE

Explanation: A change in the tax rate will not change the breakeven point.

Diff: 2

Objective: 3

AACSB: Application of knowledge

16) A firm operating at breakeven point will pay an income tax of 10%.

Answer: FALSE

Explanation: A firm operating at breakeven point will not pay income tax as operating income is \$0.

Diff: 2

Objective: 3

AACSB: Analytical thinking

17) All else being constant, an increase in operating income will result in an increase in net income.

Answer: TRUE

Diff: 1

Objective: 3

AACSB: Application of knowledge

18) If planned net income is \$30,000 and the tax rate is 30%, then planned operating income would be \$39,000.

Answer: FALSE

Explanation: If planned net income is \$30,000 and the tax rate is 30%, then planned operating income would be \$42,857, [$\$30,000 / (1.0 - 0.3) = \$42,857$].

Diff: 1

Objective: 3

AACSB: Application of knowledge

19) The Holiday Card Company, a producer of specialty cards, has asked you to complete several calculations based upon the following information:

Income tax rate	30%
Selling price per unit	\$6.60
Variable cost per unit	\$5.28
Total fixed costs	\$46,200.00

Required:

- What is the breakeven point in cards?
- What sales volume is needed to earn an after-tax net income of \$13,028.40?
- How many cards must be sold to earn an after-tax net income of \$18,480?

Answer:

a. Breakeven point in units = $\$46,200 / (\$6.60 - \$5.28) = 35,000$ units

b. Operating income = $\$13,028.40 / 0.70 = \$18,612$
 $\$18,612 + \$46,200 = \$64,812$
 Contribution per unit = $\$6.60 - \$5.28 = \$1.32$
 Breakeven sales in units = $\$64,812 / \$1.32 = 49,100$ units
 Breakeven sales = $49,100 \text{ units} \times \$6.60 = \$324,060$

c. Operating income = $\$18,480 / 0.70 = \$26,400$
 $\$26,400 + \$46,200 = \$72,600$
 Breakeven sales in units = $\$72,600 / \$1.32 = 55,000$ units

Diff: 2

Objective: 3

AACSB: Application of knowledge

20) James Corporation gathered the following information:

Variable costs	\$550,000
Income tax rate	40%
Contribution-margin ratio	30%

Required:

- Calculate the fixed costs, assuming breakeven revenue is \$2,000,000.
- Calculate sales volume in dollars to produce an after-tax net income of \$150,000.

Answer:

a. $\$2,000,000 \text{ revenue} \times \text{CM}\% 30\% = \text{CM of } \$600,000$ so FC must be \$600,000 for operating income to be zero.

b. $\$150,000 / (1 - 0.40) = \$250,000$ desired operating income. $\$250,000 + \$600,000 \text{ FC} / 0.30 = \$2,833,333$ (rounded).

Diff: 3

Objective: 3

AACSB: Application of knowledge

21) Explain what net income and what taxes can have on a manager's decision?

Answer: Net income is operating income plus nonoperating revenues such as interest revenue minus nonoperating costs such as interest cost minus income taxes. Some decisions might not result in a large operating income, but their tax consequences make them attractive because they have a positive effect on net income—the measure that drives shareholders' dividends and returns.

Diff: 2

Objective: 3

AACSB: Analytical thinking

3.4 Objective 3.4

1) Assume only the specified parameters change in a cost-volume-profit analysis. If the contribution margin increases by \$6 per unit, then _____.

- A) fixed costs increases by \$6 per unit
- B) operating income decreases by \$6 per unit
- C) fixed costs decreases by \$6 per unit
- D) operating income increases by \$6 per unit

Answer: D

Diff: 2

Objective: 4

AACSB: Application of knowledge

2) If a company is planning to reduce the selling price, they must believe that _____.

- A) variable costs will decline as well
- B) the fixed costs will cover the lower sales price
- C) more units will be sold
- D) increased collections will increase income

Answer: C

Explanation: Correct - management must believe a lower price will increase demand.

Diff: 1

Objective: 4

AACSB: Analytical thinking

3) All else being equal, a reduction in selling price will _____.

- A) increase contribution margin
- B) reduce fixed costs
- C) increase variable costs
- D) reduce operating income

Answer: D

Diff: 2

Objective: 4

AACSB: Application of knowledge

EA

4) All else being equal, an increase in advertising expenditures will _____.

- A) reduce operating income
- B) reduce contribution margin
- C) increase variable costs
- D) increase selling price

Answer: A

Diff: 2

Objective: 4

AACSB: Application of knowledge

5) Blistre Company operates on a contribution margin of 30% and currently has fixed costs of \$550,000. Next year, sales are projected to be \$3,100,000. An advertising campaign is being evaluated that costs an additional \$120,000. How much would sales have to increase to justify the additional expenditure?

- A) \$280,000
- B) \$930,000
- C) \$400,000
- D) \$550,000

Answer: C

Explanation: Required sales = $\$120,000 / 0.3 = \$400,000$

Diff: 2

Objective: 4

AACSB: Application of knowledge

6) Tony Manufacturing produces a single product that sells for \$100. Variable costs per unit equal \$45. The company expects total fixed costs to be \$78,000 for the next month at the projected sales level of 3,000 units. In an attempt to improve performance, management is considering a number of alternative actions. Each situation is to be evaluated separately. Suppose management believes that a \$85,000 increase in the monthly advertising expense will result in a considerable increase in sales. Sales must increase by _____ to justify this additional expenditure?

- A) 850 units
- B) 1,546 units
- C) 1,412 units
- D) 1,419 units

Answer: B

Explanation: $\$100X - \$45X - \$85,000 = 0$; $X = 1,546$ units to cover the expenditures

Diff: 3

Objective: 4

AACSB: Application of knowledge

7) Tony Manufacturing produces a single product that sells for \$80. Variable costs per unit equal \$50. The company expects total fixed costs to be \$82,000 for the next month at the projected sales level of 2,800 units. In an attempt to improve performance, management is considering a number of alternative actions. Each situation is to be evaluated separately. Suppose that management believes that a 14% reduction in the selling price will result in a 14% increase in sales. If this proposed reduction in selling price is implemented _____.

- A) operating income will decrease by \$23,990
- B) operating income will increase by \$7,370
- C) operating income will decrease by \$31,360
- D) operating income will increase by \$23,990

Answer: A

Explanation: Reduction in revenues = $\$80 \times 14\% = \$11.2 \times 2,800 \text{ units} = (\$31,360)$

Increase in contribution = $2,800 \text{ units} \times 14\% = 392 \text{ units} \times (\$68.8 - \$50) = \$23,990$

Change in operating income (\$7,370)

Diff: 3

Objective: 4

AACSB: Application of knowledge

8) Craylon Manufacturing produces a single product that sells for \$130. Variable costs per unit equal \$30. The company expects total fixed costs to be \$60,000 for the next month at the projected sales level of 1,200 units. In an attempt to improve performance, management is considering a number of alternative actions. Each situation is to be evaluated separately. Suppose that management believes that a \$12,000 increase in the monthly advertising expense will result in a considerable increase in sales. Sales must increase by _____ to justify this additional expenditure.

- A) 93 units
- B) 120 units
- C) 400 units
- D) 924 units

Answer: B

Explanation: $\$12,000 / (\$130 - \$30) = 120 \text{ units to cover the expenditure}$

Diff: 2

Objective: 4

AACSB: Application of knowledge

EA

9) Craylon Manufacturing produces a single product that sells for \$140. Variable costs per unit equal \$35. The company expects total fixed costs to be \$60,000 for the next month at the projected sales level of 1,500 units. In an attempt to improve performance, management is considering a number of alternative actions. Each situation is to be evaluated separately. One alternative is to increase advertising expenses by \$11,000. What is the effect on operating income with the increase of advertising expenses?

- A) Operating income will decrease by \$11,000.
- B) Operating income will increase by \$11,000.
- C) Operating income will decrease by \$86,500.
- D) Operating income will increase by \$86,500.

Answer: A

Explanation: Operating income without advertising expenses = $\$140 - 35 = \$105 \times 1,500 = 157,500 - 60,000 = \$97,500$

Operating income with advertising expenses = $157,500 - (60,000 + 11,000) = \$86,500$

Diff: 3

Objective: 4

AACSB: Application of knowledge

10) If contribution margin decreases by \$1 per unit, then operating profits will increase by \$1 per unit.

Answer: FALSE

Explanation: If contribution margin decreases by \$1 per unit, then operating profits will decrease by \$1 per unit.

Diff: 1

Objective: 4

AACSB: Application of knowledge

11) If variable costs per unit increase, then the breakeven point will decrease.

Answer: FALSE

Explanation: If variable costs per unit increase, then the breakeven point will also *increase*.

Diff: 2

Objective: 4

AACSB: Application of knowledge

12) A planned increase in advertising would be considered an increase in variable costs in CVP analysis.

Answer: FALSE

Explanation: A planned increase in advertising would be considered an increase in fixed costs in CVP analysis.

Diff: 1

Objective: 4

AACSB: Analytical thinking

13) A planned decrease in selling price would be expected to cause an increase in the quantity sold.

Answer: TRUE

Diff: 1

Objective: 4

AACSB: Analytical thinking

EA

14) In 2017, Craylon Company has sales of \$1,000,000, variable costs of \$250,000, and fixed costs of \$200,000. In 2018, the company expects annual property taxes to decrease by \$15,000.

Required:

- a. Calculate operating income and the breakeven point for 2017.
- b. Calculate the breakeven point for 2018.

Answer:

- a. In 2017, operating income is \$1,000,000 sales revenue – \$250,000 variable costs – \$200,000 fixed costs = \$550,000.

The breakeven point for 2017 is \$266,667 in total sales dollars.

Contribution margin ratio = $(\$1,000,000 - \$250,000) / \$1,000,000 = 0.75$.

Breakeven sales = $\$200,000 / 0.75 = \$266,667$.

- b. The breakeven point for 2018 is \$246,667 in total sales dollars.

Estimated fixed costs for 2018 = $\$200,000 - \$15,000 = \$185,000$.

Breakeven sales = $\$185,000 \text{ total fixed costs} / 75\% \text{ CM ratio} = \$246,667$.

Diff: 3

Objective: 4

AACSB: Application of knowledge

15) Furniture, Inc., sells lamps for \$30. The unit variable cost per lamp is \$22. Fixed costs total \$9,600.

Required:

- a. What is the contribution margin per lamp?
- b. What is the breakeven point in lamps?
- c. How many lamps must be sold to earn a pretax income of \$8,000?
- d. What is the margin of safety, assuming 1,500 lamps are sold?

Answer: a. Contribution margin per lamp = $\$30 - \$22 = \$8$

- b. N = Breakeven point in lamps

$$\$30N - \$22N - \$9,600 = 0$$

$$\$8N - \$9,600 = 0$$

$$N = \$9,600 / \$8 = 1,200 \text{ lamps}$$

- c. N = Target sales in lamps

$$\$30N - \$22N - \$9,600 - \$8,000 = 0$$

$$\$8N - \$17,600 = 0$$

$$N = \$17,600 / \$8 = 2,200 \text{ lamps}$$

- d. Margin of safety = Sales - Breakeven sales
= $(\$30.00 \times 1,500) - \$36,000 = \$9,000$

Diff: 3

Objective: 4

AACSB: Application of knowledge

EA

16) Tom's Tire Tower, Inc., sells tires for \$110. The unit variable cost per tire is \$85. Fixed costs total \$475,000.

Required:

- a. What is the contribution margin per tire?
- b. What is the breakeven point in tires?
- c. How many tires must be sold to earn a pretax income of \$450,000?
- d. What is the margin of safety, assuming 33,000 tires are sold?

Answer:

a. Contribution margin per tire = \$110 - \$85 = \$25

b. N = Breakeven point in tires
$$\begin{aligned} \$110N - \$85N - \$475,000 &= 0 \\ \$25N - \$475,000 &= 0 \\ N &= \$475,000/\$25 = 19,000 \text{ tires} \end{aligned}$$

c. N = Target sales in tires
$$\begin{aligned} \$110N - \$85N - \$450,000 - \$475,000 &= 0 \\ \$25N - \$925,000 &= 0 \\ N &= \$925,000/\$25 = 37,000 \text{ tires} \end{aligned}$$

d. Margin of safety = Sales - Breakeven sales
$$= (\$110 \times 33,000) - (\$110 \times 19,000) = \$1,540,000$$

Diff: 3

Objective: 4

AACSB: Application of knowledge

3.5 Objective 3.5

1) The margin of safety is the difference between _____.

- A) budgeted expenses and breakeven expenses
- B) budgeted revenues and breakeven revenues
- C) actual operating income and budgeted operating income
- D) actual sales margin and budgeted sales margin

Answer: B

Diff: 1

Objective: 5

AACSB: Analytical thinking

2) Sensitivity analysis is _____.

- A) a way of determining what will happen if assumptions change
- B) a way of seeing how employees will be affected by changes
- C) a way of determining how customers will react to new products
- D) a way of seeing how far from budget actual results are

Answer: A

Diff: 2

Objective: 5

AACSB: Application of knowledge

EA

3) Stones Manufacturing sells a marble slab for \$1,100. Fixed costs are \$33,000, while the variable costs are \$550 per slab. The company currently plans to sell 210 slabs this month. What is the margin of safety assuming 85 slabs are actually sold? (Round interim calculations and final calculations to the nearest whole number.)

- A) \$165,000
- B) \$49,500
- C) \$27,500
- D) \$33,000

Answer: C

Explanation: Breakeven in number of slabs = $\$33,000 / (\$1,100 - \$550) = 60$ slabs

Actual sales	85 slabs	×	\$1,100	=	\$93,500
Breakeven sales	<u>60</u> slabs	×	\$1,100	=	<u>\$66,000</u>
Margin of safety	<u>25</u> slabs				<u>\$27,500</u>

Diff: 3

Objective: 5

AACSB: Application of knowledge

4) Globus Autos sells a single product. 8,000 units were sold resulting in \$83,000 of sales revenue, \$21,000 of variable costs, and \$20,000 of fixed costs. If variable costs decrease by \$1.00 per unit, the new margin of safety is _____. (Round intermediate calculations to the nearest cent.)

- A) \$83,000
- B) \$21,000
- C) \$59,190
- D) \$63,000

Answer: C

Explanation: Variable cost per unit = $\$21,000 / 8,000 = \2.63

Contribution margin percentage = $[\$10.38 - (\$2.63 - \$1.00)] / \$10.38 = 0.84$

New breakeven point = $[\$10.38 - (\$2.63 - \$1.00)] / \$10.38 = 0.84$; $\$20,000 / 0.84 = \$23,810$

Old breakeven point = $\$10.38 - 2.63 = \$8 / \$10.38 = 1$; $\$20,000 / 1 = \$20,000$

Margin of safety = $\$83,000 - \$23,810 = \$59,190$

Diff: 3

Objective: 5

AACSB: Application of knowledge

5) Globus Autos sells a single product. 8,000 units were sold resulting in \$83,000 of sales revenue, \$21,000 of variable costs, and \$10,000 of fixed costs. If Globus reduces the selling price by \$1.20 per unit, the new margin of safety is:

- A) 6,911 units
- B) 3,042 units
- C) 4,958 units
- D) 8,000 units

Answer: A

Explanation: Correct.

New contribution margin = $\$9.18 - \$2.63 = \$6.55$

New breakeven = $\$10,000 / \$6.55 = 1,089$ (rounded)

8,000 units sold - 1,089 breakeven units = 6,911 MOS units (rounded)

Diff: 1

Objective: 5

AACSB: Analytical thinking

EA

6) The margin of safety refers to how many more sales are needed in order to breakeven,

Answer: FALSE

Explanation: Margin of safety refers to how many sales are in excess of breakeven.

Diff: 1

Objective: 5

AACSB: Analytical thinking

7) If a company's breakeven revenue is \$1,000 and its budgeted revenue is \$1,250, then its margin of safety percentage is 20%.

Answer: TRUE

Explanation: The margin of safety percentage is 20% as the denominator of the ratio is the budgeted level and not the breakeven level. $1,250 - 1,000 = \$250 / \$1,250 = 20\%$

Diff: 2

Objective: 5

AACSB: Analytical thinking

8) Sensitivity analysis is a simple approach to recognizing uncertainty.

Answer: TRUE

Diff: 1

Objective: 5

AACSB: Analytical thinking

9) Dental Comfort Services provides dental cleanings to its patients. The selling price of a cleaning is \$150 and the variable costs associated are \$85. The monthly relevant fixed costs are \$10,000.

Required:

- What is the breakeven point in cleanings?
- What is the margin of safety in dollars, assuming sales total \$30,000?
- What is the breakeven level in cleanings, assuming variable costs decrease by 20%?
- What is the breakeven level in dollars, assuming the selling price goes down by 10% and fixed costs increase \$1,000 per month?

Answer:

- N = Breakeven units

$$\begin{aligned} \$150N - \$85N - \$10,000 &= 0 \\ \$65N &= \$10,000 \\ N &= \$10,000/\$65 = 153.8 \text{ or } 154 \text{ cleanings.} \end{aligned}$$
- Margin of safety = \$30,000 - (\$150 × 154) = \$6,900
- N = Breakeven units

$$\begin{aligned} \$150N - (\$85N \times 80\%) - \$10,000 &= 0 \\ \$150N - \$68N &= \$10,000 \\ N &= \$10,000/\$68 = 147.06 \text{ or } 148 \text{ (rounded up) cleanings.} \end{aligned}$$
- N = Breakeven dollars

$$\begin{aligned} \text{CM\%} &= [(\$150 \times 90\%) - 85] / (\$150 \times 90\%) = 35.04\% \\ N &= (\$10,000 + \$1,000) / 35.04\% \\ N &= \$31,393 \text{ (rounded)} \end{aligned}$$

Diff: 3

Objective: 5

AACSB: Application of knowledge

10) Explain sensitivity analysis and how do managers use sensitivity analysis to evaluate its implications?

Answer: Sensitivity analysis is a "what-if" technique managers use to examine how an outcome will change if the original predicted data are not achieved or if an underlying assumption changes. The analysis answers questions such as "What will operating income be if the quantity of units sold decreases by 5% from the original prediction?" and "What will operating income be if variable cost per unit increases by 10%?" This helps visualize the possible outcomes that might occur before the company commits to funding a project.

Diff: 2

Objective: 5

AACSB: Analytical thinking

EA

11) _____ is the process of varying key estimates to identify those estimates that are the most critical to a decision.

- A) The graph method
- B) A sensitivity analysis
- C) The degree of operating leverage
- D) Sales mix

Answer: B

Diff: 1

Objective: 5

AACSB: Analytical thinking

3.6 Objective 3.6

Answer the following questions using the information below:

Southwestern College is planning to hold a fund raising banquet at one of the local country clubs. It has two options for the banquet:

- OPTION one: *Crestview Country Club*
- a. Fixed rental cost of \$1,000
 - b. \$12 per person for food

- OPTION two: *Tallgrass Country Club*
- a. Fixed rental cost of \$3,000
 - b. \$8.00 per person for food

Southwestern College has budgeted \$1,800 for administrative and marketing expenses. It plans to hire a band which will cost another \$800. Tickets are expected to be \$30 per person. Local business supporters will donate any other items required for the event.

- 1) Which option provides the least amount of risk?
- A) Option one
 - B) Option two
 - C) Both options provide the same amount of risk.
 - D) It depends on how many donations it receives.

Answer: A

Diff: 1

Objective: 6

AACSB: Analytical thinking

EA

2) Which option has the lowest breakeven point?

- A) Option one
- B) Option two
- C) Both options have the same breakeven point.
- D) The lowest breakeven point cannot be determined.

Answer: A

Explanation: Option one: $\$30X - \$12X - \$1,000 - \$1,800 - \$800 = 0$; $X = \$200$

Option two: $\$30X - \$8X - \$3,000 - \$1,800 - \$800 = 0$; $X = \$255$

Diff: 2

Objective: 6

AACSB: Analytical thinking

3) Which option provides the greatest operating income if 600 people attend?

- A) Option one
- B) Option two
- C) Operating incomes are identical.
- D) It depends on how many donations it receives.

Answer: B

Explanation: Option one: $\$18 \times 600 - \$3,600 = \$7,200$; Option two: $\$22 \times 600 - \$5,600 = \$7,600$

Diff: 3

Objective: 6

AACSB: Application of knowledge

4) Which option provides the greatest degree of operating leverage if 600 people attend?

- A) Option one
- B) Option two
- C) Both options provide equal degrees of operating leverage.
- D) Operating leverage is indeterminable.

Answer: B

Explanation: Option one: $\$18 \times 600 / \$7,200 = 1.50$; Option two: $\$22 \times 600 / \$7,600 = 1.74$

Diff: 3

Objective: 6

AACSB: Application of knowledge

5) Kanga Company is considering two different production plans.

Option one: Fixed costs of \$10,000 and a breakeven point of 500 units.

Option two: Fixed costs of \$20,000 and a breakeven point of 700 units.

Which option should Kanga choose if it is expecting to produce 600 units?

- A) Option one.
- B) Option two.
- C) Both options are equally good.
- D) It isn't possible to determine from the information given.

Answer: A

Explanation: Option one will result in operating income while Option 2 will result in an operating loss.

Diff: 2

Objective: 6

AACSB: Application of knowledge

EA

6) Sales of Blistre Autos are 380,000, variable cost is 230,000, fixed cost is 90,000 tax rate is 40%. Calculate the operating leverage of the company.

- A) 1.50 times
- B) 4.17 times
- C) 1.53 times
- D) 2.50 times

Answer: D

Explanation: Operating income $\$380,000 - \$230,000 - \$90,000 = \$60,000$

Operating leverage $(\$380,000 - \$230,000)/\$60,000 = 2.50$ times

Diff: 2

Objective: 6

AACSB: Application of knowledge

7) In a company with low operating leverage, _____.

- A) fixed costs are more than the contribution margin
- B) contribution margin and operating income are inversely related
- C) there is a higher possibility of net loss than a higher-leveraged firm
- D) less risk is assumed than in a highly leveraged firm

Answer: D

Diff: 1

Objective: 6

AACSB: Analytical thinking

8) If the contribution margin ratio is 0.60, targeted operating income is \$95,000, and targeted sales volume in dollars is \$530,000, then the degree of operating leverage is _____.

- A) 0.30 times
- B) 0.67 times
- C) 3.35 times
- D) 2.23 times

Answer: C

Explanation: $0.60 = X / \$530,000 = \$318,000$ contribution. Operating leverage = $\$318,000 / \$95,000 = 3.35$

Diff: 3

Objective: 6

AACSB: Application of knowledge

9) If the contribution margin ratio is 0.60, targeted operating income is \$50,000, and fixed costs are \$75,000, then sales volume in dollars is _____. (Round the final answer to the nearest dollar.)

- A) \$312,500
- B) \$208,333
- C) \$125,000
- D) \$83,333

Answer: B

Explanation: $X = (50,000 + 75,000) / 0.60$; $X = \$208,333$

Diff: 2

Objective: 6

AACSB: Application of knowledge

EA

10) If the contribution margin ratio is 0.25, targeted operating income is \$50,000, and targeted sales volume in dollars is \$260,000, then total fixed costs are _____.

- A) \$35,000
- B) \$210,000
- C) \$157,500
- D) \$15,000

Answer: D

Explanation: $(X + \$50,000)/0.25 = \$260,000$; $X = 15,000$

Diff: 3

Objective: 6

AACSB: Application of knowledge

11) Which of the following statements is true?

- A) Managers can lower operating risk by changing fixed costs to variable costs in the long-term.
- B) Managers can lower operating risk by changing variable costs to fixed costs in the long-term.
- C) Managers can lower operating risk by reducing the selling price and increasing volume.
- D) Managers can lower operating risk by increasing the selling price and reducing volume.

Answer: A

Explanation: Correct. Eliminating fixed costs reduces risk.

Diff: 2

Objective: 6

AACSB: Analytical thinking

12) When a greater proportion of costs are fixed costs, then _____.

- A) a small increase in sales results in a small decrease in operating income
- B) when demand is low the risk of loss is high
- C) a decrease in sales reduces the total fixed cost per unit
- D) a decrease in sales reduces the cost per unit

Answer: B

Diff: 2

Objective: 6

AACSB: Analytical thinking

13) Companies with a greater proportion of direct costs have a greater risk of loss than companies with a greater proportion of indirect costs.

Answer: FALSE

Explanation: Companies with a greater proportion of fixed costs have a greater risk of loss than companies with a greater proportion of variable costs.

Diff: 2

Objective: 6

AACSB: Analytical thinking

14) The degree of operating leverage at a specific level of sales helps the managers calculate the effect that potential changes in sales will have on operating income.

Answer: TRUE

Diff: 1

Objective: 6

AACSB: Analytical thinking

EA

15) If a company increases fixed costs, then the breakeven point will be lower.

Answer: FALSE

Explanation: If a company increases fixed costs, then the breakeven point will be higher.

Diff: 2

Objective: 6

AACSB: Analytical thinking

16) Companies that are substituting variable costs for fixed costs receive a greater per unit return above the breakeven point.

Answer: FALSE

Explanation: Companies that are substituting fixed costs for variable costs receive a greater per unit return above the breakeven point.

Diff: 2

Objective: 6

AACSB: Analytical thinking

17) A company with a higher degree of operating leverage is at greater risk during economic downturns because of its higher fixed costs.

Answer: TRUE

Explanation: A company with a low degree of operating leverage is at *lesser* risk during downturns in the economy.

Diff: 2

Objective: 6

AACSB: Analytical thinking

18) The risk-return tradeoff across alternative cost structures can be measured as operating leverage.

Answer: TRUE

Diff: 1

Objective: 6

AACSB: Analytical thinking

19) If a company has a degree of operating leverage of 4.0, that means a 10% increase in sales will result in a 40% increase in operating income.

Answer: TRUE

Explanation: If a company has a degree of operating leverage of 2.0, that means a 20% increase in sales will result in a 40% increase in operating income.

Diff: 2

Objective: 6

AACSB: Application of knowledge

20) When a company has the least fixed costs, the company is operating at a very high operating leverage.

Answer: FALSE

Explanation: When a company has the least fixed costs, the company is operating at a low operating leverage.

Diff: 1

Objective: 6

AACSB: Analytical thinking

21) Query Company sells pillows for \$25.00 each. The manufacturing cost, all variable, is \$10 per pillow. The company is planning on renting an exhibition booth for both display and selling purposes at the annual crafts and art convention. The convention coordinator allows three options for each participating company. They are:

1. paying a fixed booth fee of \$5,010, or
2. paying an \$4,000 fee plus 10% of revenue made at the convention, or
3. paying 20% of revenue made at the convention.

Required:

- a. Compute the breakeven sales in pillows of each option.
- b. Which option should Query Company choose, assuming sales are expected to be 800 pillows?

Answer:

- a. Option 1 N = Breakeven in pillows

$$\$25N - \$10N - \$5,010 = 0$$

$$\$15N - \$5,010 = 0$$

$$N = \$5,010/\$15 = 334 \text{ pillows}$$

- Option 2 N = Breakeven in pillows

$$\$25N - \$10N - 0.10(\$25N) - \$4,000 = 0$$

$$\$12.5N - \$4,000 = 0$$

$$N = \$4,000/\$12.5 = 320 \text{ pillows}$$

- Option 3 N = Breakeven in pillows

$$\$25N - \$10N - 0.20(\$25N) = 0$$

$$\$10N - \$0 = 0$$

$$N = \$0/\$10 = 0 \text{ pillows}$$

- b. Option 1 profit for 800 pillows = $\$15 \times 800 - \$5,010 = \$6,990$
- Option 2 profit for 800 pillows = $\$12.5 \times 800 - 4,000 = \$6,000$
- Option 3 profit for 800 pillows = $\$10 \times 800 = \$8,000$
- Option 3 is the best choice.

Diff: 3

Objective: 6

AACSB: Application of knowledge

22) Auto Tires has been in the tire business for four years. It rents a building but owns all of its equipment. All employees are paid a fixed salary except for the busy season (April-June), when temporary help is hired by the hour. Utilities and other operating charges remain fairly constant during each month except those in the busy season.

Selling prices per tire average \$75 except during the busy season. Because a large number of customers buy tires prior to winter, discounts run above average during the busy season. A 15% discount is given when two tires are purchased at one time. During the busy months, selling prices per tire average \$60.

The president of Auto Tires is somewhat displeased with the company's management accounting system because the cost behavior patterns displayed by the monthly breakeven charts are inconsistent; the busy months' charts are different from the other months of the year. The president is never sure if the company has a satisfactory margin of safety or if it is just above the breakeven point.

Required:

- a. Why might it be difficult to use CVP in this situation?
- b. How can the information be presented in a better format for the president?

Answer:

- a. The accounting system includes some assumptions about the CVP model that does not hold for Auto Tire. The CVP model requires cost and revenue to be linear. During the busy months, the company has costs and revenues which behave differently than during the other months of the year. The revenue line turns down (less slope) with the average selling price per tire decreasing from \$75 to \$60. The variable costs line probably turns upward (increasing slope) with the additional hourly workers being added to the work force.
- b. The accountant may want to present two sets of information regarding the revenue and cost behaviors of the company: one for the busy season and one for the other months of the year. It would show that while the breakeven point actually increases during the busy months (a negative), the marginal income increases because of increased sales (a positive).

Diff: 3

Objective: 6

AACSB: Analytical thinking

23) Dolph and Evan started the DE Restaurant in 2015. They rented a building, bought equipment, and hired two employees to work full time at a fixed monthly salary. Utilities and other operating charges remain fairly constant during each month.

During the past two years, the business has grown with average sales increasing 1% a month. This situation pleases both Dolph and Evan, but they do not understand how sales can grow by 1% a month while profits are increasing at an even faster pace. They are afraid that one day they will wake up to increasing sales but decreasing profits.

Required:

Explain why the profits have increased at a faster rate than sales. Use the terms variable costs and fixed costs in your response.

Answer: The fixed cost per meal served is decreasing with increased volumes, while the contribution margin per meal served remains constant. Apparently, most of the restaurant's expenses are fixed. Therefore, as sales pass the breakeven point the profit will increase even faster because the fixed expenses have already been covered. This allows sales to cover only variable expenses before contributing to the profit margin, thereby causing it to increase at a faster rate.

Diff: 3

Objective: 6

AACSB: Analytical thinking

24) Freddie's Company has mostly fixed costs and Valerie's Company has mostly variable costs. Which company has the greatest risk of a net loss? Explain why.

Answer: Freddie's Company has the greatest risk of net loss because more units are required to reach breakeven point than for Valerie. Freddie's Company is operating at a higher operating leverage than Valerie's Company and hence faces a larger risk of loss during economic downturn.

Diff: 2

Objective: 6

AACSB: Analytical thinking

25) Suppose a company decided to automate a production line. Explain what effects this would have on a company's cost structure using CVP terminology. Could these changes have any possible negative effect on the firm?

Answer: An automated production line would increase fixed costs through extra depreciation on the new machinery and also decrease variable costs due to the elimination of direct labor as a result of automation. This would increase the breakeven point. This could possibly have a negative effect on the firm if demand for the product produced by this production line is expected to decline in the future. With high fixed costs and low demand, a decline in profits might be more severe due to the presence of unchanging fixed costs as volume drops.

Diff: 2

Objective: 6

AACSB: Analytical thinking

EA

26) If a company has a degree of operating leverage of 5 and sales increase by 30%, then _____.

- A) total fixed costs will increase by 150%
- B) total costs will increase by 150%
- C) profit will increase by 120%
- D) profit will increase by 150%

Answer: D

Explanation: $5 \times 30\% = 150\%$

Diff: 3

Objective: 6

AACSB: Application of knowledge

27) If a company would like to increase its degree of operating leverage it should _____.

- A) increase its sales relative to its fixed costs
- B) increase its sales relative to its variable costs
- C) increase its variable costs relative to its fixed costs
- D) increase its fixed costs relative to its variable costs

Answer: D

Diff: 2

Objective: 6

AACSB: Analytical thinking

3.7 Objective 3.7

1) The following information is for Alex Corp:

Product X: Revenue	\$12.00
Variable Cost	\$4.50
Product Y: Revenue	\$44.50
Variable Cost	\$9.50
Total fixed costs	\$75,000

What is the breakeven point assuming the sales mix consists of two units of Product X and one unit of Product Y?

- A) 842.5 units of Y and 1,685 units of X
- B) 3,000 units of Y and 1,500 units of X
- C) 1 units of Y and 10,000 units of X
- D) 1,500 units of Y and 3,000 units of X

Answer: D

Explanation: D) $N =$ units of product Y; and $2N =$ units of product X;

$$(\$12.00 - \$4.50) \times 2N + (\$44.50 - \$9.50) \times N - \$75,000 = 0$$

$$\$15.00N + \$35.00N = \$75,000$$

$$\$50N = \$75,000$$

$$N = 1,500 \text{ units}$$

Product Y = 1,500 units; Product X = 3,000 units

Diff: 3

Objective: 7

AACSB: Application of knowledge

EA

2) The following information is for Alex Corp:

Product X: Revenue	\$12.00
Variable Cost	\$4.50
Product Y: Revenue	\$25.00
Variable Cost	\$10.00
Total fixed costs	\$40,500

What is the operating income, assuming actual sales total 120,000 units, and the sales mix is two units of Product X and one unit of Product Y?

- A) 1,159,500
- B) 1,200,000
- C) 1,960,000
- D) 1,240,500

Answer: A

Explanation:	<u>Product X</u>	<u>Product Y</u>	<u>Total</u>
Sales units	<u>80,000</u>	<u>40,000</u>	<u>120,000</u>
Revenue	\$960,000	\$1,000,000	\$1,960,000
Var. costs	<u>360,000</u>	<u>400,000</u>	<u>760,000</u>
CM			1,200,000
Fixed costs			<u>40,500</u>
			<u>\$1,159,500</u>

Diff: 3

Objective: 7

AACSB: Application of knowledge

Answer the following questions using the information below:

The following information is for Alex Corp:

Product X: Revenue	\$15.00
Variable Cost	\$2.50
Product Y: Revenue	\$25.00
Variable Cost	\$10.00
Total fixed costs	\$50,000

EA

3) If the sales mix shifts to one unit of Product X and two units of Product Y, then the weighted-average contribution margin will _____.

- A) increase per unit
- B) stay the same
- C) decrease per unit
- D) decrease by \$0.50 per unit

Answer: A

Diff: 3

Objective: 7

AACSB: Application of knowledge

4) If the sales mix shifts to one unit of Product X and two units of Product Y, then the breakeven point will _____.

- A) increase
- B) stay the same
- C) decrease
- D) will be greater than the original breakeven point

Answer: C

Diff: 2

Objective: 7

AACSB: Application of knowledge

5) The following information is for the Jeffries Corporation:

Product A: Revenue	\$14.00
Variable Cost	\$8.00
Product B: Revenue	\$36.00
Variable Cost	\$14.00
Total fixed costs	\$522,000

What is the breakeven point, assuming the sales mix consists of three units of Product A and one unit of Product B?

- A) 14,500 units of A and 4,833 units of B
- B) 39,150 units of A and 13,050 units of B
- C) 87,000 units of A and 0 units of B
- D) 13,050 units of A and 39,150 units of B

Answer: B

Explanation: N = units of product B; and $3N$ = units of product A;

$$(\$14.00 - \$8.00) \times 3N + (\$36.00 - \$14.00) \times N - \$522,000 = 0$$

$$\$18.00N + \$22.00N = \$522,000$$

$$\$40N = \$522,000$$

$$N = 13,050 \text{ units}$$

Product A = 39,150 units; Product B = 13,050 units

Diff: 3

Objective: 7

AACSB: Application of knowledge

EA

6) The following information is for the Jeffries Corporation:

Product A: Revenue	\$18.00
Variable Cost	\$14.00
Product B: Revenue	\$21.00
Variable Cost	\$13.00
Total fixed costs	\$143,000

What is the operating income of Jeffries Corporation, assuming actual sales total 35,600 units, and the sales mix is three units of Product A and one unit of Product B?

- A) \$35,000
- B) \$178,000
- C) \$667,500
- D) \$321,000

Answer: A

Explanation:

	<u>Product A</u>	<u>Product B</u>	<u>Total</u>
Sales units	<u>26,700</u>	<u>8,900</u>	<u>35,600</u>
Revenue	\$480,600	\$186,900	\$667,500
Var. costs	<u>373,800</u>	<u>115,700</u>	<u>489,500</u>
CM			\$178,000
Fixed costs			<u>143,000</u>
			<u>\$35,000</u>

Diff: 3

Objective: 7

AACSB: Application of knowledge

Answer the following questions using the information below:

The following information is for the Jeffries Corporation:

Product A: Revenue	\$16.00
Variable Cost	\$12.00
Product B: Revenue	\$24.00
Variable Cost	\$16.00
Total fixed costs	\$75,000

EA

7) Assume the sales mix consists of three units of Product A and one unit of Product B. If the sales mix shifts to four units of Product A and one unit of Product B, then the weighted-average contribution margin will _____.

- A) increase per unit
- B) stay the same
- C) decrease per unit
- D) cannot be determined from this information

Answer: C

Diff: 2

Objective: 7

AACSB: Application of knowledge

8) Assume the sales mix consists of three units of Product A and one unit of Product B. If the sales mix shifts to four units of Product A and one unit of Product B, then the breakeven point will _____.

- A) increase
- B) stay the same
- C) decrease
- D) cannot be determined from this information

Answer: A

Diff: 2

Objective: 7

AACSB: Application of knowledge

EA

9) Assuming a constant mix of 3 units of X for every 1 unit of Y.

	<u>X</u>	<u>Y</u>	<u>Total</u>
Sales	\$29	\$45	
VC	18	25	
Total fixed costs			\$81,000

The breakeven point in units would be _____.

- A) 4,584 units of X and 1,528 units of Y
- B) 1,528 units of X and 1,528 units of Y
- C) 3,056 units of X and 9,168 units of Y
- D) 1,528 units of X and 4,584 units of Y

Answer: A

Explanation:	<u>X</u>	<u>Y</u>
Sales	\$29	\$45
Variable costs	<u>18</u>	<u>25</u>
Contribution margin	\$11	\$20
Sales mix	<u>× 3</u>	<u>× 1</u>
Contribution margin per mix	<u>\$33</u>	<u>\$20</u>

Total contribution margin per mix = \$33 + \$20 = \$53

Breakeven point in composite units = \$81,000 / \$53 = 1,528

X: 1,528 × 3 = 4,584 units

Y: 1,528 × 1 = 1,528 units

Diff: 3

Objective: 7

AACSB: Application of knowledge

10) In multiproduct situations, when sales mix shifts toward the product with the lowest contribution margin then _____.

- A) total revenues will increase
- B) interest cost will decrease
- C) total contribution margin will increase
- D) operating income will decrease

Answer: D

Diff: 3

Objective: 7

AACSB: Analytical thinking

11) Sales mix is the quantities or proportion of various products or services that constitute a company's total unit sales.

Answer: TRUE

Diff: 1

Objective: 7

AACSB: Analytical thinking

12) If the sales mix shifts toward the lower-contribution-margin product, the breakeven quantity will decrease.

Answer: FALSE

Explanation: If the sales mix shifts toward the lower-contribution-margin product the breakeven quantity will increase.

Diff: 1

Objective: 7

AACSB: Application of knowledge

13) In multiproduct situations, when sales mix shifts toward the product with the lowest contribution margin, the operating income will be lower.

Answer: TRUE

Diff: 1

Objective: 7

AACSB: Application of knowledge

14) In most multiproduct situations when sales mix shifts toward the product with the highest contribution margin, operating income will be higher.

Answer: TRUE

Diff: 2

Objective: 7

AACSB: Application of knowledge

15) To calculate the breakeven point in a multiproduct situation, one must assume that the sales mix of the various products remains constant.

Answer: TRUE

Diff: 2

Objective: 7

AACSB: Application of knowledge

16) If a company's sales mix is 2 units of product A for every 3 units of product B, and the company sells 3,000 units in total of both products, only 2,000 units of product A will be sold.

Answer: FALSE

Explanation: If a company's sales mix is 2 units of product A for every 3 units of product B, and the company sells 3,000 units in total of both products, 1,200 units of product A will be sold and 1,800 units of product B will be sold.

Diff: 2

Objective: 7

AACSB: Analytical thinking

17) Ken's Beer Emporium sells beer and ale in both pint and quart sizes. If Ken's sells twice as many pints as it sells quarts, and sells 2,400 items total, it will sell 800 quarts of ale.

Answer: TRUE

Diff: 2

Objective: 7

AACSB: Analytical thinking

18) Karen Hefner, a florist, operates retail stores in several shopping malls. The average selling price of an arrangement is \$30 and the average cost of each sale is \$18. A new mall is opening where Karen wants to locate a store, but the location manager is not sure about the rent method to accept. The mall operator offers the following three options for its retail store rentals:

1. paying a fixed rent of \$15,000 a month, or
2. paying a base rent of \$9,000 plus 10% of revenue received, or
3. paying a base rent of \$4,800 plus 20% of revenue received up to a maximum rent of \$25,000.

Required:

- a. For each option, compute the breakeven sales and the monthly rent paid at break-even.
- b. Beginning at zero sales, show the sales levels at which each option is preferable up to 5,000 units.

Answer:

- a. Option 1 N = Breakeven units

$$\$30N - \$18N - \$15,000 = 0$$

$$\$12N - \$15,000 = 0$$

$$N = \$15,000/\$12 = 1,250 \text{ units}$$

$$\text{Rent at breakeven} = \$15,000$$

- Option 2 N = Breakeven units

$$\$30N - \$18N - 0.10(\$30N) - \$9,000 = 0$$

$$\$9N - \$9,000 = 0$$

$$N = \$9,000/\$9 = 1,000 \text{ units}$$

$$\text{Rent at breakeven} = \$9,000 + (0.10 \times \$30 \times 1,000) = \$12,000$$

- Option 3 N = Breakeven units

$$\$30N - \$18N - 0.20(\$30N) - \$4,800 = 0$$

$$\$6N - \$4,800 = 0$$

$$N = \$4,800/\$6 = 800 \text{ units}$$

$$\text{Rent at breakeven} = \$4,800 + (0.20 \times \$30 \times 800) = \$9,600$$

- b. Option 3 from 0 to 1,400 units for \$4,800 plus \$6 per unit.
 Option 2 from 1,401 to 2,000 for \$9,000 plus \$3 per unit.
 Option 1 above 2,000 for \$15,000.

Option 1 equals Option 2 when sales are 2,000 and favors Option 1 above 2,000 units.

$$\$15,000 = \$9,000 + 0.10(\$30N); \$6,000 = \$3N; N = 2,000$$

Option 1 equals Option 3 when sales are 1,700 and favors Option 1 above 1,700 units.

$$\$15,000 = \$4,800 + 0.20(\$30N); \$10,200 = \$6N; N = 1,700 \text{ units}$$

Diff: 3

Objective: 7

AACSB: Application of knowledge

EA

19) Craylon Manufacturing Company produces two products, X and Y. The following information is presented for both products:

	<u>X</u>	<u>Y</u>
Selling price per unit	\$40	\$25
Variable cost per unit	25	15

Total fixed costs are \$275,000.

Required:

- Calculate the contribution margin for each product.
- Calculate breakeven point in units of both X and Y if the sales mix is 3 units of X for every unit of Y.
- Calculate breakeven volume in total dollars if the sales mix is 2 units of X for every 3 units of Y.

Answer:

- X: Contribution margin $\$40 - \$25 = \$15$
Y: Contribution margin $\$25 - \$15 = \$10$
- Contribution margin $(3 \times \$15) + (1 \times \$10) = \$55$
Breakeven point in units $\$275,000 / \$55 = 5,000$ units
X: $5,000 \times 3 = 15,000$ units
Y: $5,000 \times 1 = 5,000$ units
- Contribution margin $(2 \times \$15) + (3 \times \$10) = \$60$
Breakeven point in units $\$275,000 / \$60 = 4,583.33$ units
X: Dollar sales = $4,583.33 \times 2 = 9,167 \times \$40 = \$366,680$ (rounded)
Y: Dollar sales = $4,583 \times 3 = 13,750 \times \$25 = \$343,750$
Total dollar sales = \$710,430

Diff: 3

Objective: 7

AACSB: Application of knowledge

20) Ballpark Concessions currently sells hot dogs. During a typical month, the stand reports a profit of \$9,000 with sales of \$50,000, fixed costs of \$21,000, and variable costs of \$0.64 per hot dog.

Next year, the company plans to start selling nachos for \$3 per unit. Nachos will have a variable cost of \$0.72 and new equipment and personnel to produce nachos will increase monthly fixed costs by \$8,808. Initial sales of nachos should total 5,000 units. Most of the nacho sales are anticipated to come from current hot dog purchasers, therefore, monthly sales of hot dogs are expected to decline to \$20,000.

After the first year of nacho sales, the company president believes that hot dog sales will increase to \$33,750 a month and nacho sales will increase to 7,500 units a month.

Required:

- Determine the monthly breakeven sales in dollars before adding nachos.
- Determine the monthly breakeven sales during the first year of nachos sales, assuming a constant sales mix of 1 hotdog and 2 units of nachos.

EA

Answer:

a. Contribution margin = Fixed costs + Profit
= \$21,000 + \$9,000 = \$30,000

Variable costs = Sales - Contribution margin
= \$50,000 - \$30,000
= \$20,000

Units sold = \$20,000/\$0.64 = 31,250 units

Selling price = \$50,000/31,250 = \$1.60 per unit

Unit Variable costs = \$20,000/31,250 = \$0.64

N = Breakeven units

$$1.60N - 0.64N - 21,000 = 0$$

$$0.96N - 21,000 = 0$$

$$N = 21,000/0.96 = 21,875 \text{ units}$$

b. Ratio equal to 1 hot dog to 2 units of nachos.

N = Breakeven number of units of hot dogs

2N = Breakeven number of units of nachos

$$3(2)N + 1.60N - 0.72(2N) - 0.64N - 29,808 = 0$$

$$7.60N - 2.08N - 29,808 = 0$$

$$N = 29,808/5.52 = 5,400 \text{ hot dogs}$$

Therefore, 5,400 hot dogs and 10,800 units of nachos need to be sold to break even.

Diff: 3

Objective: 7

AACSB: Application of knowledge

21) Fine Suiting Company sells shirts for men and boys. The average selling price and variable cost for each product are as follows:

	<u>Men's</u>		<u>Boys'</u>
Selling Price	\$25.00	Selling Price	\$24.00
Variable Cost	\$15.40	Variable Cost	\$16.00

Fixed costs are \$35,200.

Required:

- What is the breakeven point in units for each type of shirt, assuming the sales mix is 1:1?
- What is the operating leverage, assuming the sales mix is 2:1 in favor of men's shirts, and sales total 5,000 shirts?

Answer:

- $N = \text{breakeven in boys' shirts}$ $N = \text{breakeven in men's shirts}$

$$\text{Contribution for men} = \$25 - \$15.40 = \$9.60$$

$$\text{Contribution for boys} = \$24 - \$16.00 = \$8.00.$$

$$\text{Total} = \$9.60 + \$8.00 = \$17.60$$

$$\text{B.E.P} = \$35,200 / \$17.60 = 2,000 \text{ units.}$$

- Total sales = 6,000 units in 2:1 ratio gives 4,000 units for men and 2,000 units for boys. \$148,000

$$\text{Contribution for men} = 4,000 \times \$9.60 = \$38,400; \text{Contribution for boys} = 2,000 \times \$8.00 = \$16,000.$$

$$\text{Total contribution} = \$54,400$$

$$\text{Operating leverage} = \$54,400 / \$148,000 = 0.368$$

Diff: 3

Objective: 7

AACSB: Application of knowledge

22) Mount Carmel Company sells only two products, Product A and Product B.

	Product A	Product B	Total
Selling price	\$40	\$50	
Variable cost per unit	\$24	\$40	
Total fixed costs			\$840,000

Mount Carmel sells two units of Product A for each unit it sells of Product B. Mount Carmel faces a tax rate of 30%.

Required:

- What is the breakeven point in units for each product assuming the sales mix is 2 units of Product A for each unit of Product B?
- What is the breakeven point if Mount Carmel's tax rate is reduced to 25%, assuming the sales mix is 2 units of Product A for each unit of Product B?
- How many units of each product would be sold if Mount Carmel desired an after-tax net income of \$73,500, facing a tax rate of 30%?

Answer:

- a. $N = \text{breakeven in product B}$ $2N = \text{breakeven in product A}$

$$(\$40 \times 2N) + (\$50 \times N) - (\$24 \times 2N) - (\$40 \times N) - \$840,000 = 0$$

$$(\$130 \times N) - (\$88 \times N) - \$840,000 = 0$$

$$\$42N - \$840,000 = 0$$

$$N = \$840,000 / \$42 = 20,000$$

Therefore, to break even, 40,000 units of Product A and 20,000 units of Product B need to be sold.

- b. The breakeven point would be the same. At the breakeven point there is no pre-tax income, so the tax rate change is irrelevant in this situation.

- c. $N = \text{number of units of product B}$ $2N = \text{number of units of product A}$

$$(\$40 \times 2N) + (\$50 \times N) - (\$24 \times 2N) - (\$40 \times N) - \$840,000 =$$

$$\$73,500 / (1 - .3)$$

$$(\$130 \times N) - (\$88 \times N) - \$840,000 = \$105,000$$

$$\$42N - \$945,000 = 0$$

$$N = \$945,000 / \$42 = 22,500$$

Therefore, to meet the profit goal, $2 \times N = 45,000$ units of Product A and $N = 22,500$ units of Product B need to be sold.

Diff: 3

Objective: 7

AACSB: Application of knowledge

23) Atlanta Radio Supply sells only two products, Product X and Product Y.

	Product X	Product Y	Total
Selling price	\$25	\$45	
Variable cost per unit	\$20	\$35	
Total fixed costs			\$350,000

Atlanta Radio Supply sells three units of Product X for each two units it sells of Product Y. Atlanta Radio Supply has a tax rate of 25%.

Required:

- What is the breakeven point in units for each product, assuming the sales mix is 3 units of Product X for each two units of Product Y?
- How many units of each product would be sold if Atlanta Radio Supply desired an after-tax net income of \$210,000, using its tax rate of 25%?

Answer:

- $3N = \text{breakeven in product X}$ $2N = \text{breakeven in product Y}$

$$(\$25 - \$20) \times 3N + (\$45 - \$35) \times 2N - \$350,000 = 0$$

$$\$15N + \$20N - \$350,000 = 0$$

$$\$35N - \$350,000 = 0$$

$$N = \$350,000 / \$35 = 10,000$$

Therefore, to break even, 30,000 ($10,000 \times 3$) units of Product X and 20,000 ($10,000 \times 2$) units of Product Y need to be sold.

- $3N = \text{number of units of product X}$ $2N = \text{number of units of product Y}$

$$(\$25 - \$20) \times 3N + (\$45 - \$35) \times 2N - \$350,000 = \$210,000 / (1 - .25)$$

$$\$15N + \$20N - \$350,000 = \$280,000$$

$$\$35N - \$350,000 = \$280,000$$

$$\$35N - \$630,000 = 0$$

$$N = \$630,000 / \$35 = 18,000$$

Therefore, to meet the profit goal, $3 \times N = 54,000$ units of Product X and $2 \times N = 36,000$ units of Product Y need to be sold.

Diff: 3

Objective: 7

AACSB: Application of knowledge

24) What is sales mix? How do companies choose their sales mix?

Answer: Sales mix is the quantities or proportion of various products or services that constitute a company's total unit sales. Managers adjust their mix to respond to demand changes. Assume there are two Products A and B. If there is a shift in production to Product A due to high demand, then this increases the breakeven point because the sales mix has shifted toward a lower-contribution-margin product and under no circumstances the manager should change the sales mix to lower the breakeven point without taking into account customer preferences and demand.

Diff: 2

Objective: 7

AACSB: Analytical thinking

25) Stella Company sells only two products, Product A and Product B.

	Product A	Product B	Total
Selling price	\$50	\$30	
Variable cost per unit	\$20	\$10	
Total fixed costs			\$2,110,000

Stella sells two units of Product A for each unit it sells of Product B. Stella faces a tax rate of 40%. Stella desires a net after-tax income of \$54,000. The breakeven point in units would be _____.

A) 25,250 units of Product A and 50,500 units of Product B

B) 27,500 units of Product A and 55,000 units of product B

C) 50,500 units of Product A and 25,250 units of Product B

D) 55,000 units of Product A and 27,500 units of Product B

Answer: D

Explanation: Desired pre-tax net income $\$54,000 / (1.0 - 0.4) = \$90,000$

Weighted contribution margin $[2 \times (\$50 - \$20)] + [1 \times (\$30 - \$10)] = \$80$

Breakeven point in composite units is $(\$90,000 + \$2,110,000) / \$80 = 27,500$

27,500 composite units is $(2 \times 27,500) = 55,000$ units of A and

$(1 \times 27,500) = 27,500$ units of B

Diff: 3

Objective: 7

AACSB: Application of knowledge

3.8 Objective 3.8

1) Service companies and not-for-profit organizations _____.

- A) cannot use CVP because they don't manufacture a product
- B) cannot use CVP because there is no way to distinguish fixed and variable costs
- C) can use CVP by focusing on measuring the organization's output
- D) can use CVP by treating all costs as variable

Answer: C

Diff: 2

Objective: 8

AACSB: Analytical thinking

2) While-You-Train is a not-for-profit organization that aids the unemployed by supplementing their incomes by \$7,000 annually, while they seek new employment skills. The organization has fixed costs of \$200,000 and the budgeted appropriation for the year totals \$750,000. How many individuals can receive financial assistance this year?

- A) 29 people
- B) 108 people
- C) 79 people
- D) 136 people

Answer: C

Explanation: $\$750,000 - \$7,000N - \$200,000 = 0$; $\$550,000 = \$7,000N$; $N = 79$ people

Diff: 2

Objective: 8

AACSB: Application of knowledge

3) Helping Hands is a nonprofit organization that supplies electric fans during summer for individuals in need. Fixed costs are \$290,000. The fans cost \$26 each. The organization has a budgeted appropriation of \$675,000. How many people can receive a fan during summer?

- A) 11,154 people
- B) 14,808 people
- C) 25,962 people
- D) 37,116 people

Answer: B

Explanation: $\$675,000 - \$26N - \$290,000 = 0$; $\$385,000 = \$26N$; $N = 14,808$ people

Diff: 2

Objective: 8

AACSB: Application of knowledge

EA

4) To apply CVP analysis in a not-for profit organization _____.

- A) managers need to focus on the customer base rather than the cost drivers
- B) managers need to focus on measuring their output, which is the same as tangible units sold by manufacturing and merchandising companies
- C) managers need to focus on measuring their input, which is different from the tangible units consumed by manufacturing and merchandising companies
- D) managers need to focus on measuring their output, which is different from the tangible units sold by manufacturing and merchandising companies

Answer: D

Diff: 2

Objective: 8

AACSB: Analytical thinking

5) Which of the following is an output measure for a hospital?

- A) number of doctors needed to cater to patients
- B) number of patients admitted every day in a hospital
- C) number of days spent by a patient in a hospital
- D) charges applicable on the number of days spent by a patient in a hospital

Answer: C

Diff: 2

Objective: 8

AACSB: Analytical thinking

3.9 Objective 3.9

1) Gross margin is _____.

- A) sales revenue less variable costs
- B) sales revenue less cost of goods sold
- C) contribution margin less fixed costs
- D) contribution margin less variable costs

Answer: B

Diff: 1

Objective: 9

AACSB: Analytical thinking

2) In the merchandising sector _____.

- A) only variable costs are subtracted to determine gross margin
- B) fixed overhead costs are subtracted to determine gross margin
- C) fixed overhead costs are subtracted to determine contribution margin
- D) all operating costs are subtracted to determine contribution margin

Answer: A

Diff: 1

Objective: 9

AACSB: Analytical thinking

EA

3) In the manufacturing sector, _____.

- A) only variable costs are subtracted to determine gross margin
- B) fixed overhead costs are subtracted to determine gross margin
- C) fixed overhead costs are subtracted to determine contribution margin
- D) all operating costs are subtracted to determine contribution margin

Answer: B

Diff: 2

Objective: 9

AACSB: Analytical thinking

4) Contribution margin and gross margin are terms that can be used interchangeably.

Answer: FALSE

Explanation: Contribution margin and gross margin refer to different amounts.

Revenues - all variable costs = contribution margin; Revenues - COGS = gross margin

Diff: 1

Objective: 9

AACSB: Analytical thinking

5) Gross Margin will always be greater than contribution margin.

Answer: FALSE

Explanation: If variable costs are low and/or manufacturing fixed costs are high, then contribution margin can easily be greater than gross margin.

Revenues - all variable costs = contribution margin; Revenues - COGS = gross margin

Diff: 1

Objective: 9

AACSB: Analytical thinking

6) Jacob's Manufacturing sales is equal to production. If Jacob's Manufacturing presented a Financial Accounting Income Statement emphasizing gross margin showing operating income of \$180,000. A Contribution Income Statement emphasizing contribution margin would show a different operating income.

Answer: FALSE

Explanation: If Jacob's Manufacturing presented a Financial Accounting Income Statement emphasizing gross margin showing operating income of \$180,000, a Contribution Income Statement emphasizing contribution margin would show the same operating income.

Diff: 2

Objective: 9

AACSB: Analytical thinking

EA

7) Beta Corp reported the following:

Revenues	\$2,500
Variable manufacturing costs	\$ 300
Variable nonmanufacturing costs	\$ 480
Fixed manufacturing costs	\$ 350
Fixed nonmanufacturing costs	\$ 270

Required:

- Compute contribution margin.
- Compute gross margin.
- Compute operating income.

Answer:

- Contribution margin $\$2,500 - \$300 - \$480 = \$1,720$
- Gross margin $\$2,500 - \$300 - \$350 = \$1,850$
- Operating income $\$2,500 - \$300 - \$480 - \$350 - \$270 = \$1,100$

Diff: 3

Objective: 9

AACSB: Application of knowledge

3.10 Objective 3.A

1) What would be the expected monetary value for Avalia Corp using the probability method?

<u>Probability</u>	<u>Cash Inflows</u>
0.20	\$260,000
0.30	\$200,000
0.15	\$160,000
0.35	\$60,000

- \$680,000
- \$170,000
- \$157,000
- \$52,000

Answer: C

Explanation: Monetary value = $0.20 (\$260,000) + 0.30 (\$200,000) + 0.15 (\$160,000) + 0.35 (\$60,000) = \$157,000$

Diff: 2

Objective: Appendix

AACSB: Analytical thinking

EA

2) Lobster Liquidators will make \$550,000 if the fishing season weather is good, \$240,000 if the weather is fair, and would actually lose \$40,000 if the weather is poor during the season. If the weather service gives a 45% probability of good weather, a 25% probability of fair weather, and a 30% probability of poor weather, what is the expected monetary value for Lobster Liquidators?

- A) \$247,500
- B) \$295,500
- C) \$750,000
- D) \$250,000

Answer: B

Explanation: $0.45 (\$550,000) + 0.25 (\$240,000) + 0.3 (-\$40,000) = \$295,500$

Diff: 2

Objective: Appendix

AACSB: Application of knowledge

Answer the following questions using the information below:

Patrick Ross has three booth rental options at the county fair where he plans to sell his new product. The booth rental options are:

- Option 1: \$1,000 fixed fee, or
- Option 2: \$750 fixed fee + 5% of all revenues generated at the fair, or
- Option 3: 20% of all revenues generated at the fair.

The product sells for \$37.50 per unit. He is able to purchase the units for \$12.50 each.

3) How many actions and events will a decision table contain?

- A) 1 action and 3 events
- B) 1 action and 6 events
- C) 2 actions and 3 events
- D) 3 actions and 6 events

Answer: D

Diff: 2

Objective: Appendix

AACSB: Application of knowledge

EA

4) Which option should Patrick choose to maximize income assuming there is a 40% probability that 70 units will be sold and a 60% probability that 40 units will be sold?

- A) Option 1
- B) Option 2
- C) Option 3
- D) All options maximize income equally.

Answer: C

Explanation: Expected revenues = $0.4(70 \times \$37.50) + 0.6(40 \times \$37.50) = \$1,950$

Expected CM before options = $0.4(70 \times \$25) + 0.6(40 \times \$25) = \$1,300$

Option 1: $\$1,300 - \$1,000 = \$300$

Option 2: $\$1,300 - \$750 - 0.05(\$1,950) = \452.50

Option 3: $\$1,300 - 0.2(\$1,950) = \$910^*$

* = maximization of income

Diff: 3

Objective: Appendix

AACSB: Application of knowledge

5) When there are multiple cost drivers the simple CVP formula of $Q = (FC + OI)/CMU$ can still be used.

Answer: FALSE

Explanation: When there are multiple cost drivers the simple CVP formula no longer applies.

Diff: 1

Objective: Appendix

AACSB: Analytical thinking

6) There is a difference between a good decision and a good outcome and one can exist without the other.

Answer: TRUE

Diff: 1

Objective: Appendix

AACSB: Analytical thinking

7) A decision table is a summary of the alternative actions, events, outcomes, and probabilities of events.

Answer: TRUE

Diff: 1

Objective: Appendix

AACSB: Analytical thinking

8) Maria makes tortillas and sells them from her house. She is concerned about purchasing too many ingredients and having to throw away unsold tortillas at the end of the day. It costs her \$5.00 to make 100 tortillas and she sells them for \$20.00 per 100. She has kept track of sales and discovered that she can sell 1,500 tortillas about 25% of the time, 1,000 tortillas about 50% of the time and only 500 tortillas the rest of the time. What is the minimum number of tortillas should she make daily to maximize profit? Round to the nearest 100 tortillas.

Answer: 1,000 tortillas.

She cannot sell more than she makes, so if she makes 500 she has a 100% probability of selling them all for a profit of \$75.

If she makes 600, she is likely to sell 575 ($500 \times 25\% + 600 \times 50\% + 600 \times 25\%$) and so her revenue is \$115 ($575 \times 20/100$) and costs are \$30 ($600 \times 5/100$) yielding a profit of \$85.

Following this logic, at 1,000 tortillas, she is likely to sell 875 with revenue of \$175 and costs of \$50. This is the minimum number of tortillas she can make to earn \$125 profit. At any level above this, up to 1,500 tortillas, her profit will remain \$125. Above 1,500 tortillas, her profit will decline do to production exceeding maximum likely sales.

Diff: 3

Objective: Appendix

AACSB: Application of knowledge

9) Lauren had been a manager of a major hotel chain for 15 years. Due to a hotel owner's illness, Lauren was offered the opportunity to purchase a hotel near a vacation area she had often visited. It was a great place surrounded by mountains and known for its scenic beauty. After obtaining a lawyer and an accountant to assist her, Lauren did an analysis of the business and evaluated several contingencies relating to various scenarios. Since the expected monetary value of the various scenarios was much higher than the price of the hotel, she decided to purchase the hotel. She resigned her position, obtained a loan, and purchased the hotel. The following year, there was a severe economic downturn and also a very bad weather season that reduced the number of guests and also caused a resulting mold situation in the hotel building that required expensive repair work. Lauren ran short of cash, became emotionally distraught, and eventually had to sell the hotel at a significant loss. Was it a bad decision for her to purchase the hotel instead of keeping her other managerial position? Explain.

Answer: A decision made has its own ups and downs. Decisions were made based on information that was available at the time of evaluating and making the decision. Since she used to visit the place often for her vacation, she should have known about the occupancy level of the hotel and should have known on the area's climatic conditions and its implications. However, a downturn in the market is unpredictable. She should have made an alternative plan in the event of an economic downturn. Thus, it is a case of misfortune and carelessness in evaluating the project completely.

Diff: 3

Objective: Appendix

AACSB: Application of knowledge