

Multiple Choice

1. CVP Analysis is an important decision making tool for which reason?
 - a) Determining product mix
 - b) Setting selling price
 - c) Maximizing use of facilities
 - d) All of the above
2. A Company has a contribution margin of 40% and fixed costs of \$120,000. What is the break-even point in dollars?
 - a) \$48,000
 - b) \$300,000
 - c) \$200,000
 - d) \$72,000
3. P Company has fixed costs of \$200,000, sales price of \$50, and variable cost of \$30 per unit. How many units must be sold to earn profit of \$50,000?
 - a) 2,500
 - b) 10,000
 - c) 12,500
 - d) 25,000
4. B Company has fixed costs of \$20,000 and a contribution margin ratio of 40%. Currently, sales are \$75,000. What is Bowl's margin of safety?
 - a) \$20,000
 - b) \$25,000
 - c) \$30,000
 - d) \$50,000
5. Z Company makes two different products, Product A and Product B. They currently sell 2,000 units of product A and 3,000 units of product B. What is the sales mix percentages?
 - a) Product A= 40%, Product B= 60%
 - b) Product A= 60%, Product B= 40%
 - c) Product A= 67%, Product B= 33%
 - d) Product A= 33%, Product B= 67%

6. Degree of operating leverage is calculated as
 - a) Net income divided by contribution margin
 - b) Break-even sales divided by net income.
 - c) Net income divided by break-even sales.
 - d) Contribution margin divided by net income

7. N Company sells two products. Product A sells for \$100 per unit, and has unit variable costs of \$60. Product B sells for \$70 per unit, and has unit variable costs of \$50. Currently, N Company sells three units of product A for every one unit of product B sold. N Company has fixed costs of \$750,000. How many units would N Company have to sell to earn a profit of \$300,000?
 - a) 7,500 units of A and 22,500 units of B
 - b) 22,500 units of A and 7,500 units of B
 - c) 17,600 units of A and 12,400 units of B
 - d) 12,400 units of A and 17,600 units of B

8. Pear Company sells three products. Pear is having difficulty making all of the required products because it only has limited hours available on the machine that is used to produce all products. Determine the order in which the products should be made to produce the most profit based on the below information.

	Tablets	Phones	Computers
Sales per unit	\$1000	\$800	\$2,500
Variable cost per unit	\$600	\$250	\$1,000
Machine Hours per unit	1	.5	1.5

- a) Tablets, Phones, Computers
 - b) Computer, Phones, Tablet
 - c) Phones, Computer, Tablet
 - d) Computer, Tablet, Phone
-
9. Goat Company provide the following CVP income statement. What is the degree of operating leverage?

Sales	\$850,000
Variable Costs	<u>325,000</u>
Contribution Margin	525,000
Fixed Costs	<u>300,000</u>
Net Income	<u><u>225,000</u></u>

- a) 2.33
- b) 1.61
- c) 1.08
- d) 0.57

10. A high degree of operating leverage means which of the following?
- a) A company has higher fixed costs relative to variable costs
 - b) A company has higher variable costs relative to fixed costs
 - c) A company has higher net income in comparison to sales
 - d) A company has higher sales in comparison to net income

Practice Problems

Practice Problem #1

W Company sells only one product with a selling price of \$200 and a variable cost of \$80 per unit. The company's monthly fixed expense is \$60,000.

- Required:
- A) Determine the breakeven point in units sold and sales dollars.
 - B) Determine the breakeven point in units sold and sales dollars if the company wants a net income of \$30,000.
 - C) Determine margin of safety if current sales are \$175,000.

Practice Problem #2

The H Company had wine sales for December as follows:

	<u>Red</u>	<u>White</u>
Bottles sold	100	40
Average selling price	\$80	\$45
Average variable cost	\$40	\$15

The only other cost is the wine director's salary of \$36,000 per year.

- Required:
- a) Prepare an income statement by type of wine and in total for December.

- b) Calculate breakeven in sales dollars by type of wine using the weighted average contribution margin ratio. Calculate breakeven in sales dollars by type of wine using the weighted average unit contribution margin.

Practice Problem #3

F Company is debating whether to purchase new equipment that would increase fixed costs from \$96,000 to \$196,000, and decrease variable costs from \$14 per unit to \$8 per unit. If it were to implement the change at its current production level of 100,000, profit would not change. Selling price is \$20 per unit.

- Required:
- Prepare an income statement showing the changes to fixed and variable costs
 - Calculate the degree of operating leverage for each situation and explain the change.

Practice Problem #4

K Company produces three picnic products: coolers, baskets and grills. Each product requires a limited resource of materials. In which order should the products be produced to maximize profits? A product line income statement for the year is shown below:

	<u>Koolers</u>	<u>Baskets</u>	<u>Grills</u>	<u>Total</u>
Units Sold	2,000	2,500	1,500	
Sales	\$360,000	\$600,000	\$240,000	\$1,200,000
Variable expenses	<u>198,000</u>	<u>420,000</u>	<u>120,000</u>	<u>738,000</u>
CM	162,000	180,000	120,000	462,000
Fixed expenses				<u>240,000</u>
Operating income				\$262,000
Materials	8lbs	6lbs	4lbs	

Solutions

- | | |
|-----|---|
| 1. | D |
| 2. | B |
| 3. | C |
| 4. | B |
| 5. | A |
| 6. | D |
| 7. | B |
| 8. | C |
| 9. | A |
| 10. | A |

Solution #1

A)

CM ratio	=	$\frac{\text{Sales} - \text{variable expenses}}{\text{Sales}}$	=	$\frac{\$200 - 80 = 120}{\$200}$
	=	60%		
Breakeven sales	=	$\frac{\text{Fixed expenses} + \text{operating income}}{\text{Contribution margin ratio}}$	=	$\frac{\$60,000 + \$0}{60\%}$
	=	\$100,000		
Breakeven units	=	$\frac{\text{Fixed expenses} + \text{operating income}}{\text{Contribution margin \$ per unit}}$	=	$\frac{\$60,000 + \$0}{\$120}$
	=	500 units		

B)

CM ratio	$\frac{\text{Sales} - \text{variable expenses}}{\text{Sales}}$	$\frac{\$200 - 80 = 120}{\$200}$	60%
Sales	$\frac{\text{Fixed expenses} + \text{operating income}}{\text{Contribution margin ratio}}$	$\frac{\$60,000 + \$30,000}{60\%}$	\$150,000
Units	$\frac{\text{Fixed expenses} + \text{operating income}}{\text{Contribution margin \$ per unit}}$	$\frac{\$60,000 + \$30,000}{\$120}$	750 units
OR			
Units	$\frac{\text{Sales}}{\text{Selling price per unit}}$	$\frac{\$150,000}{\$200}$	750 units

C)

Actual Sales- Breakeven Sales= Margin of Safety

$$\$175,000 - 100,000 = \$75,000$$

Solution #2a) Current income statement:

	<u>Red</u>	<u>White</u>	<u>Total</u>
Bottles sold	100	40	
Average selling price	\$80	\$45	
Total sales	\$8,000	\$1,800	\$9,800
Average cost	\$40	\$15	
Total Cost	\$4,000	\$600	4,600
Contribution margin	\$4,000	\$1,200	5,200
Fixed expenses			3,000
Operating income			<u>\$2,200</u>

Break-even in Sales Dollars

	Red	White
Sales Dollars	8,000	1,800
Total Sales	9,800	9,800
Sales Mix	82%	18%

Contribution Margin	4,000	1,200	
Sales	8,000	1,800	
Contribution Margin Ratio	50%	67%	
Sales Mix	82%	18%	
			Total
Weighted Average Contribution Margin Ratio	41%	12%	53%

Fixed Cost 3,000
 / Weighted Average Contribution Margin Ratio 53%
 = Break-even in Sales Dollars \$ 5,653.85

	Sales Mix	* Break-even	Break-even in Sales Dollars Per Product
Red	82%	\$ 5,653.85	\$ 4,615.38
White	18%	\$ 5,653.85	\$ 1,038.46

Break-even in units

	Red	White	Total
Units Sold	100	40	
Total Units	140	140	
Sales Mix	71%	29%	
Contribution Margin per unit	40	30	
Sales Mix	71%	29%	
Weighted Average Unit Contribution Margin	\$ 28.57	\$ 8.57	\$ 37.14

Fixed Cost 3,000
 / Weighted Average Unit Contribution Margin 37.14
 = Break-even in Units 80.77

	Sales Mix	* Break-even	Break-even in unit Per Product	Verify with Breakeven in sales dollars	
					4615.38
Red	71%	80.77	57.69	80	5
					1038.46
White	29%	80.77	23.08	45	2

Solution #3

<i>Units Sold</i>		<i>20,000</i>		<i>20,000</i>
Sales	\$20.00	\$400,000	\$20.00	\$400,000
Variable	<u>\$14.00</u>	<u>280,000</u>	<u>\$8.00</u>	<u>160,000</u>
CM	\$6.00	140,000	\$12.00	240,000
Fixed		<u>96,000</u>		<u>196,000</u>
Net		\$44,000		\$44,000
Income				
Degree of Operating Leverage		3.18		5.45

A higher degree of operating leverage exposes a company to greater earnings volatility risk. They will earn more as sales increase, but have potential to lose more if there is a decrease in sales.

Solution #4

K Company produces three picnic products: coolers, baskets and grills. Each product requires a limited resource of materials. In which order should the products be produced to maximize profits? A product line income statement for the year is shown below:

	<u>Koolers</u>	<u>Baskets</u>	<u>Grills</u>
Units Sold	2,000	2,500	1,500
Sales	\$360,000	\$600,000	\$240,000
Variable expenses	<u>198,000</u>	<u>420,000</u>	<u>120,000</u>
CM	162,000	180,000	120,000
CM per unit	81	72	80
Materials	8lbs	6lbs	4lbs
CM per Material	10.13	12	20

Production order: Grills, Baskets, Koolers