

## Chapter 4 – Relevant Costing Exam Prep Handout

1. The Bremmer Company produces 5,000 units of item ZQ98 annually at a total cost of \$200,000.

Direct materials	\$ 20,000
Direct labor	55,000
Variable overhead	45,000
Fixed overhead	<u>80,000</u>
Total	<u>\$200,000</u>

The Daisy Company has offered to supply all 5,000 units of ZQ98 per year for \$35 per unit. If Bremmer accepts the offer, \$8 per unit of the fixed overhead would be saved. In addition, some of Bremmer's leased facilities could be vacated, reducing lease payments by \$30,000 per year. At what price would Bremmer be indifferent to Daisy's offer?

- A. \$40.
- B. \$38.
- C. \$35.
- D. \$24.

# Make vs. Buy Decision (Indifference Price)

Exam Prep  
Handout

## Chapter 4 - Relevant Costing

1. The Bremmer Company produces 5,000 units of item ZQ98 annually at a total cost of \$200,000.

Direct materials	\$ 20,000	$\$120,000 \div 5,000 \text{ units} = \$24/\text{unit}$
Direct labor	55,000	
Variable overhead	45,000	
Fixed overhead	80,000	$\div 50,000 = \$16/\text{unit}$
Total	\$200,000	

The Daisy Company has offered to supply all 5,000 units of ZQ98 per year for \$35 per unit. If Bremmer accepts the offer, \$8 per unit of the fixed overhead would be saved. In addition, some of Bremmer's leased facilities could be vacated, reducing lease payments by \$30,000 per year. At what price would Bremmer be indifferent to Daisy's offer?

- A. \$40.
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- C. \$35.
- D. \$24.

Indifference Point	} $\left. \begin{array}{l} \text{"Make"} \\ \text{cost} \end{array} \right\} = \left. \begin{array}{l} \text{"Buy"} \\ \text{cost} \end{array} \right\}$	Units	5000	1	5000	
		4	DM	20,000	35 Price	175,000
		11	DL	55,000		
		9	VMOH	45,000	8 FMOH	40,000
		16	FMOH	80,000	(6) Lease Savings	(30,000)
		40		\$200,000		185,000

$$40 = (\$3) + 37$$

Difference

"Buy" Cost				
35	+	\$3	=	\$38
		difference		Indifference Price

1. The Bremmer Company produces 5,000 units of item ZQ98 annually at a total cost of \$200,000.

Direct materials	\$ 20,000
Direct labor	55,000
Variable overhead	45,000
Fixed overhead	<u>80,000</u>
Total	<u>\$200,000</u>

The Daisy Company has offered to supply all 5,000 units of ZQ98 per year for \$35 per unit. If Bremmer accepts the offer, \$8 per unit of the fixed overhead would be saved. In addition, some of Bremmer's leased facilities could be vacated, reducing lease payments by \$30,000 per year. At what price would Bremmer be indifferent to Daisy's offer?

A. \$40.

B. \$38.

C. \$35.

D. \$24.

$$\underbrace{\$20,000 + 55,000 + 45,000}_{\$24} + \underbrace{(8 \times 5,000)}_{\$8} + \underbrace{30,000}_{\$6} = \$190,000 / 5,000 \text{ units} = \$38$$

AACSB: Analytic

AICPA FN: Decision Making

Blooms: Analyze

Difficulty: 3 Hard

Learning Objective: 04-04 Understand how to apply differential analysis to production decisions.

Topic Area: Make-It or Buy-It Decisions

2. The following information relates to the Jax Company for the upcoming year.

	<u>Amount</u>	<u>Per Unit</u>
Sales	\$8,000,000	\$ 20.00
Cost of goods sold	<u>6,400,000</u>	<u>16.00</u>
Gross margin	1,600,000	4.00
Operating expenses	<u>600,000</u>	<u>1.50</u>
Operating profits	<u>\$1,000,000</u>	<u>\$ 2.50</u>

The cost of goods sold includes \$2,400,000 of fixed manufacturing overhead; the operating expenses include \$200,000 of fixed marketing expenses. A special order offering to buy 50,000 units for \$15.00 per unit has been made to Jax. Fortunately, there will be no additional operating expenses associated with the order and Jax has sufficient capacity to handle the order. How much will operating profits increase if Jax accepts the special order?

- A. \$50,000.
- B. \$125,000.
- C. \$200,000.
- D. \$250,000.
- E. Operating profits will not increase as a result of accepting the special order.



# Special Order

2. The following information relates to the Jax Company for the upcoming year.

	<u>Amount</u>	<u>Per Unit</u>	<u>Amount</u>
Sales	\$8,000,000	\$ 20.00	8,000,000
Cost of goods sold	<u>6,400,000</u>	<u>16.00</u>	4,000,000 VCGS
Gross margin	1,600,000	4.00	2,400,000 FCGS
Operating expenses	<u>600,000</u>	<u>1.50</u>	400,000 V. op. expenses
Operating profits	<u><u>\$1,000,000</u></u>	<u><u>\$ 2.50</u></u>	200,000 F. op. expenses

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fixed (marketing)

- A. \$50,000.
- B. \$125,000.
- C. \$200,000.
- D. \$250,000.
- E. Operating profits will not increase as a result of accepting the special order.

			<u>Special Order</u>	
Units	<u>400,000</u>	<u>1</u>	<u>1</u>	<u>50,000</u> Units
S	8,000,000	20	\$15	\$750,000 Sales
- VC	VCGS 4,000,000 V. op. ex 400,000 <u>4,400,000</u>	11	11	
CM	3,600,000	9	4	<u>200,000</u> NI (CM)
- FC	FCGS 2,400,000 F. op. ex 200,000 <u>2,600,000</u>			
NI	<u><u>1,000,000</u></u>			

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	<u>Amount</u>	<u>Per Unit</u>
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Operating profits	<u>\$1,000,000</u>	<u>\$ 2.50</u>

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- A. \$50,000.
- B. \$125,000.
- C. \$200,000.**
- D. \$250,000.
- E. Operating profits will not increase as a result of accepting the special order.

Cost of sales:  $(6,400,000 - 2,400,000)/400,000 = \$10$ ; Operating Exp:  $(600,000 - 200,000)/400,000 = 1.00$ ; Sales  $\$15.00 - 10 - 1 = \$4 \times 50,000$  units = \$200,000

AACSB: Analytic  
AICPA FN: Decision Making  
Blooms: Apply  
Difficulty: 3 Hard

Learning Objective: 04-02 Understand how to apply differential analysis to pricing decisions.  
Topic Area: Short-Run Pricing Decisions: Special Orders

3. Scherer Corporation is preparing a bid for a special order that would require 720 liters of material U48N. The company already has 560 liters of this raw material in stock that originally cost \$6.30 per liter. Material U48N is used in the company's main product and is replenished on a periodic basis. The resale value of the existing stock of the material is \$5.80 per liter. New stocks of the material can be readily purchased for \$6.65 per liter. What is the relevant cost of the 720 liters of the raw material when deciding how much to bid on the special order? (CIMA adapted)

- A. \$4,592.
- B. \$4,788.
- C. \$4,456.
- D. \$4,176.

# Special Order

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A. \$4,592.

B. \$4,788.

C. \$4,456.

D. \$4,176.

Existing Stock  
560 liters x \$6.30 per liter = \$3,528 = Irrelevant (Sunk Cost)

560 liters x \$5.80 per liter = \$3,248 = Irrelevant  
[cost estimated, not proved by a sale]

New Stock  
720 liters x \$6.65 per liter (purchase price) = \$4,788 relevant cost.

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A. \$4,592.

**B. \$4,788.**

C. \$4,456.

D. \$4,176.

720 liters × current market \$6.65 = \$4,788

*AICPA FN: Measurement*

*Blooms: Apply*

*Difficulty: 3 Hard*

*Learning Objective: 04-02 Understand how to apply differential analysis to pricing decisions.*

*Topic Area: Short-Run Pricing Decisions: Special Orders*



### E 4-33. Special Orders

Carlsbad Enterprises has a capacity to produce 400,000 computer cases per year. The company is currently producing and selling 320,000 cases per year at a selling price of \$80 per case. The cost of producing and selling one case follows:

Variable manufacturing costs .....	\$32
Fixed manufacturing costs .....	8
Variable selling and administrative costs.....	16
Fixed selling and administrative costs.....	4
<b>Total costs .....</b>	<b><u>\$60</u></b>

The company has received a special order for 20,000 cases at a price of \$50 per case. Because it does not have to pay a sales commission on the special order, the variable selling and administrative costs would be only \$10 per case. The special order would have no effect on total fixed costs. The company has rejected the offer based on the following computations:

Selling price per case .....	\$50
Variable manufacturing costs .....	32
Fixed manufacturing costs .....	8
Variable selling and administrative costs.....	10
Fixed selling and administrative costs.....	4
<b>Net profit (loss) per case .....</b>	<b><u>\$(4)</u></b>

#### Required

- What is the impact on profit for the year if Carlsbad accepts the special order? Show computations.
- Do you agree with the decision to reject the special order? Explain.

# Special Order

## E 4-33. Special Orders

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Variable selling and administrative costs .....	16	
Fixed selling and administrative costs .....	4	
Total costs .....	<u>\$60</u>	

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Selling price per case .....	\$50
Variable manufacturing costs .....	32
Fixed manufacturing costs .....	8
Variable selling and administrative costs .....	10
Fixed selling and administrative costs .....	4
Net profit (loss) per case .....	<u>\$(4)</u>

**Required**

- a. What is the impact on profit for the year if Carlsbad accepts the special order? Show computations.
- b. Do you agree with the decision to reject the special order? Explain.

*Solution* →

E 4-33 (25 min.) Special Orders: Carlsbad Enterprises.

Carlsbad should accept the offer; profit is higher by \$160,000.

a.

	(a)	(b)	(b)-(a)
	Status Quo 320,000 Units	Alternative 340,000 20,000 Units	Difference
Sales revenue	\$ 25,600	\$ 26,600	\$ 1,000 (higher)
Variable costs:			
Manufacturing	10,240	10,880	640 (higher)
Selling and administrative	5,120	5,320	200 (higher)
Contribution margin	\$ 10,240	\$ 10,400	\$ 160 (higher)
Fixed costs <sup>a</sup>	3,840	3,840	0
Operating profit	\$ 6,400	\$ 6,560	\$ 160 (higher)

a \$3,840,000 = 320,000 units x (\$8 fixed manufacturing + \$4 fixed selling).

Alternative presentation.

	Per Unit	20,000 Units (\$000)
Sales revenue	\$50	\$1,000
Variable costs		
Manufacturing costs	32	640
Selling and administrative costs	10	200
Contribution to operating profit	\$8	\$160

b. Based on incremental profits, the company should accept the offer. However, it should consider the impact of accepting the order on its regular customers and the possibility that the customer with the special order will expect special pricing on future orders.

*(\$160,000 higher profit.)*

### E 4-35. Pricing Decisions

Mother's Bottlers, Inc., is a small bottling company that bottles and sells cold teas for \$5 per unit. The cost of each unit follows:

Materials .....	\$1.50
Labor .....	1.00
Variable overhead .....	0.50
Fixed overhead (\$20,000 per month, 20,000 units per month) ...	<u>1.00</u>
Total costs per unit .....	<u>\$4.00</u>

One of Mother's regular customers asked the company to fill a special order of 2,000 units at a selling price of \$3.50 per unit. Mother's can fill the order using existing capacity without affecting total fixed costs for the month. However, Mother's manager was concerned about selling at a price below the \$4.00 cost per unit and has asked for your advice.

#### **Required**

- Prepare a schedule to show the impact of providing the special order of 2,000 units on Mother's profits in addition to the regular production and sales of 20,000 units per month.
- Based solely on the data given, what is the lowest price per unit at which the bottled teas could be sold for the special order without reducing Mother's profits?
- What other factors might Mother's managers want to consider in setting a price for the special order?



# Special Order

## E 4-35. Pricing Decisions

Mother's Bottlers, Inc., is a small bottling company that bottles and sells cold teas for \$5 per unit. The cost of each unit follows:

Materials .....	\$1.50	3.00
Labor .....	1.00	
Variable overhead .....	0.50	
Fixed overhead (\$20,000 per month, 20,000 units per month) ...	1.00	
Total costs per unit .....	<u>\$4.00</u>	

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### Required

- a. Prepare a schedule to show the impact of providing the special order of 2,000 units on Mother's profits in addition to the regular production and sales of 20,000 units per month.
- b. Based solely on the data given, what is the lowest price per unit at which the bottled teas could be sold for the special order without reducing Mother's profits?
- c. What other factors might Mother's managers want to consider in setting a price for the special order?

	Regular Sales		Special Order	
	1	20,000	2,000	1
S	5	100,000	7,000	3.50
VC	3	60,000	6,000	3.00
CM	2	40,000	1,000	0.50
FC	20,000	20,000	—	—
NI		20,000	1,000	

**(a)** ↑

**(b)** ← lowest special order price

**(c)** Other factors:

- effect on regular customers.
- Future expectations of special order customer.



E 4-35 (30 min.) Pricing Decisions: Mother's Bottlers.

a.	Status Quo 20,000 Bottles	Alternative 22,000 Bottles	Difference
Sales revenue .....	<u>\$100,000</u> <sup>a</sup>	<u>\$107,000</u> <sup>b</sup>	<u>\$7,000</u> (higher)
Less variable costs:			
Materials.....	30,000	33,000	3,000 (higher)
Labor .....	20,000	22,000	2,000 (higher)
Variable overhead .....	<u>10,000</u>	<u>11,000</u>	<u>1,000</u> (higher)
Total variable cost.....	<u>\$60,000</u>	<u>\$66,000</u>	<u>\$6,000</u> (higher)
Contribution margin.....	\$40,000	\$41,000	\$1,000 (higher)
Less fixed costs .....	<u>20,000</u>	<u>20,000</u>	<u>0</u> (higher)
Operating profit .....	<u>\$ 20,000</u>	<u>\$ 21,000</u>	<u>\$1,000</u> (higher)

Operating profits would be higher with the additional order by \$1,000.

<sup>a</sup>\$100,000 = 20,000 bottles x \$5.00 per bottle.

<sup>b</sup>\$107,000 = (20,000 bottles x \$5.00 per bottle) + (2,000 bottles x \$3.50 per bottle).

- b. The lowest price the bottled tea could be sold without reducing profits is \$3.00 per bottle, which would just cover the variable costs of the tea.
- c. An important factor to consider would be the effect on the regular business once other customers learn of the special price. It is also important for the manager to understand that this customer will expect this price concession in the future and at that time the company may be operating at capacity.

**E 4-40. Target Costing**

Terracotta, Inc., makes toy soldiers. Company management believes that a new model would sell well at a price of \$65. The company estimates unit materials costs to be \$16 for the model, and overhead costs would average \$20 per unit. The local wage rate for direct labor is \$28 per hour. Terracotta has a goal of earning an operating profit of 30 percent of manufacturing costs for each of its products.

***Required***

What direct labor hour input (hours per unit) could Terracotta allow and still achieve its profit goal?

# New Product Line

## E 4-40. Target Costing

Terracotta, Inc., makes toy soldiers. Company management believes that a new model would sell well at a price of \$65. The company estimates unit materials costs to be \$16 for the model, and overhead costs would average \$20 per unit. The local wage rate for direct labor is \$28 per hour. Terracotta has a goal of earning an operating profit of 30 percent of manufacturing costs for each of its products.

### Required

What direct labor hour input (hours per unit) could Terracotta allow and still achieve its profit goal?

given

Price	$\frac{1}{\$65}$	
- Cost	?	= (16 <sub>DM</sub> + 28 <sub>DL</sub> + 20 <sub>MOH</sub> )
Profit	(.3Cost)	

1 hour

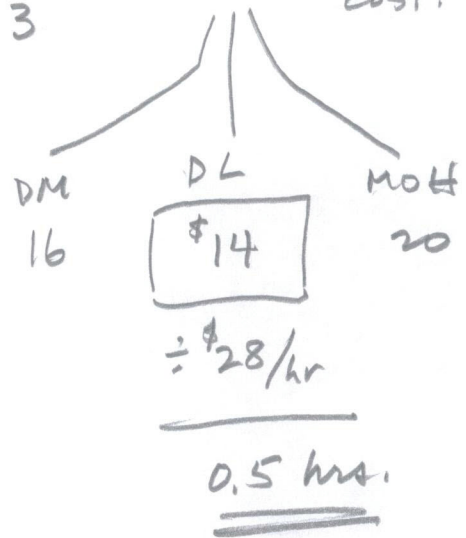
Profit = 30% × Cost

Profit + Cost = Price

.3 Cost + 1.0 Cost = \$65

Cost =  $\frac{\$65}{1.3} = \$50$

highest acceptable cost.



E 4-40 (20 min.) Target Costing: Terracotta, Inc.

0.5 hours.

The target cost for Terracotta is calculated as follows:

$$\begin{aligned} \text{Profit} &= (\text{Price} - \text{Costs}) = 30\% \text{ Costs} \\ \frac{\text{Price}}{1.30} &= \text{Highest acceptable costs} \\ \frac{\$65.00}{1.30} &= \text{Highest acceptable costs} \\ \$50.00 &= \text{Highest acceptable costs} \end{aligned}$$

The target labor cost is \$14 per unit (= \$50 total cost - \$16 material cost - \$20 overhead cost). Given a wage rate of \$28 per direct labor hour, the maximum direct labor time per unit is 0.5 hours (= \$14 ÷ \$28).

#### E 4-44. Dropping Product Lines

Atlantic Soup Company is presently operating at 75 percent of capacity. Worried about the company's performance, the president is considering dropping its clam chowder line. If clam chowder is dropped, the revenue associated with it would be lost and the related variable costs saved. In addition, the company's total fixed costs would be reduced by 15 percent.

Segmented income statements appear as follows:

Product	Tomato	Clam Chowder	Chicken Noodle
Sales .....	\$32,600	\$42,800	\$51,200
Variable costs .....	<u>22,000</u>	<u>38,600</u>	<u>40,100</u>
Contribution margin .....	\$10,600	\$ 4,200	\$11,100
Fixed costs allocated to each product line .....	<u>4,700</u>	<u>6,000</u>	<u>7,100</u>
Operating profit (loss) .....	<u>\$ 5,900</u>	<u>\$ (1,800)</u>	<u>\$ 4,000</u>

#### Required

Prepare a differential cost schedule like the one in Exhibit 4.8 (see below) to indicate whether Atlantic should drop the clam chowder product line.

	Status Quo: Keep Prints	Alternative: Drop Prints	Difference
Sales revenue .....	\$80,000	\$70,000	\$10,000 decrease
Cost of sales (all variable) .....	<u>53,000</u>	<u>45,000</u>	<u>8,000 decrease</u>
Contribution margin .....	\$27,000	\$25,000	\$ 2,000 decrease
Less fixed costs:			
Rent .....	4,000	4,000	-0-
Salaries .....	5,000	4,000	1,000 decrease
Marketing and administrative .....	<u>3,000</u>	<u>2,750</u>	<u>250 decrease</u>
Operating profit (loss) .....	<u>\$15,000</u>	<u>\$14,250</u>	<u>\$ 750 decrease</u>

Exhibit 4.8 Differential Analysis—U-Develop



# Drop Product Line

## E 4-44. Dropping Product Lines

Atlantic Soup Company is presently operating at 75 percent of capacity. Worried about the company's performance, the president is considering dropping its clam chowder line. If clam chowder is dropped, the revenue associated with it would be lost and the related variable costs saved. In addition, the company's total fixed costs would be reduced by 15 percent.

Segmented income statements appear as follows:

Product	Tomato	Clam Chowder	Chicken Noodle	<u>Total</u>
Sales .....	\$32,600	\$42,800	\$51,200	126,600
Variable costs .....	22,000	38,600	40,100	100,700
Contribution margin .....	<u>\$10,600</u>	<u>\$ 4,200</u>	<u>\$11,100</u>	25,900
Fixed costs allocated to each product line .....	4,700	6,000	7,100	<u>17,800</u>
Operating profit (loss) .....	<u>\$ 5,900</u>	<u>\$(1,800)</u>	<u>\$ 4,000</u>	8,100

Required

$\$15,130 = 0.85 \times 17,800$  ←

Prepare a differential cost schedule like the one in Exhibit 4.8 (see below) to indicate whether Atlantic should drop the clam chowder product line.

*Example*

	Status Quo: Keep Prints	Alternative: Drop Prints	Difference
Sales revenue .....	\$80,000	\$70,000	\$10,000 decrease
Cost of sales (all variable) .....	<u>53,000</u>	<u>45,000</u>	<u>8,000 decrease</u>
Contribution margin .....	\$27,000	\$25,000	\$ 2,000 decrease
Less fixed costs:			
Rent .....	4,000	4,000	-0-
Salaries .....	5,000	4,000	1,000 decrease
Marketing and administrative ...	3,000	2,750	250 decrease
Operating profit (loss) .....	<u>\$15,000</u>	<u>\$14,250</u>	<u>\$ 750 decrease</u>

	<u>Total CC if Drop clam chowder</u>	<u>Δ</u>	
Rev	$126,600 - \square = 83,800$	42,800	
- VC	$100,700 - \square = 62,100$	38,600	
CM	$25,900 - \square = 21,700$	4200	~ lost CM
- FC	$17,800 - \square = 15,130$	2670	~ reduction in FC
Profit	$8,100 - \square = 6,570$	<u>1,530</u>	~ reduction in Profit if CC dropped.

∴ Keep clam Chowder for higher profit.

**E 4-44 (30 min.) Dropping Product Lines: Atlantic Soup Company.**

	Status Quo	Alternative: Drop Clam Chowder	Difference (all lower under the alternative)
Revenue .....	\$126,600	\$83,800	\$42,800
Less Variable Costs.....	<u>(100,700)</u>	<u>(62,100)</u>	<u>(38,600)</u>
Contribution Margin .....	\$ 25,900	\$ 21,700	\$ 4,200
Less Fixed Costs.....	<u>(17,800)</u>	<u>(15,130) <sup>a</sup></u>	<u>(2,670)</u>
Operating Profit .....	<u>\$ 8,100</u>	<u>\$ 6,570</u>	<u>\$ 1,530</u>

<sup>a</sup> \$15,130 = \$17,800 × .85

Atlantic Soup Company should keep the clam chowder line because the loss of its contribution margin is greater than the reduction in fixed costs.