

Lanen 6e – Chapter 4 Practice Quiz Questions
 Fundamentals of Cost Analysis for Decision Making

Hand LO 4-2
 106) The following information relates to a product produced by Baywatch Company:

Direct materials
 Direct labor
 Variable overhead
 Fixed overhead
 Unit cost

				60,000
				1
				\$ 150
				VC 115
				CM 35
				\$ 2,100,000
				(a)

Fixed selling costs are \$1,000,000 per year. Although production capacity is 900,000 units per year, Baywatch expects to produce only 800,000 units next year. The product normally sells for \$180 each. A customer has offered to buy 60,000 units for \$150 each. The customer will pay the transportation charge on the units purchased.

Required:

- a. Compute the effect on operating profits if Baywatch accepts the special order.
- b. If Baywatch accepts the special order, how much could normal sales drop before all of the differential profits disappear?

$$\begin{array}{r}
 \$2,100,000 \\
 \hline
 (180 - 115) \\
 \hline
 \end{array}
 = 32,308 \text{ units (b)}$$

normal sales price VC

106) Answer: a.

$[\$150 - (\$50 + \$35 + \$30)] \times 60,000 = \$2,100,000$ increase.

b.

$\$2,100,000 / (\$180 - \$115) = 32,308$ units.

Difficulty: 3 Hard

Topic: Differential Analysis and Pricing Decisions

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

Bloom's: Analyze

AACSB: Analytical Thinking

Accessibility: Keyboard Navigation

Hand LO 4-4
 110) The Fortune Company produces 15,000 units of Part QT34 annually at a total cost of \$600,000.

Direct materials	\$ 60,000
Direct labor	165,000
Manufacturing overhead	375,000
Total	<u>\$ 600,000</u>

$\times 36\% = 135,000 \text{ VMOH}$
 $\times 64\% = 240,000 \text{ FMOH}$

Manufacturing overhead is 36% variable. The Xu Company has offered to supply all 15,000 units of Part QT34 per year for \$35 per unit. If Fortune accepts the offer, \$8 per unit of the fixed overhead would be avoided. In addition, some of Fortune's leased facilities could be vacated, reducing lease payments by \$90,000 per year.

Required:

- a. By how much would Fortune's operating profits change if 15,000 of Part QT34 are purchased from Xu?
- b. At what price would Fortune be indifferent to Xu's offer?

	<u>Make</u>	<u>Buy</u>
VC	15,000 units [DM 60,000 DL 165,000 VMOH 135,000] 360,000	525,000
FC	16 240,000 90,000 -----	120,000 (16-8)
Total Cost.	690,000	645,000

(a)

$\Delta = 45,000$ increase in profits if Fortune buys.

(b) $\frac{\$ 45,000}{15,000} = \$ 3/\text{unit}$

$\$ 3 + \$ 35 = \$ 38$ Indifference price

110) Answer:

a.

Buy: $\$35 \times 15,000 = \$525,000$; Make: $\$60,000 + \$165,000 + (\$375,000 \times 36\%) + (\$8 \times 15,000) + \$90,000 = \$570,000$; $\$525,000 - \$570,000 = \$45,000$ increase in profits.

b.

$\$570,000/15,000 = \38 .

Difficulty: 3 Hard

Topic: Use of Differential Analysis for Production Decisions

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

Bloom's: Analyze

AACSB: Analytical Thinking

Accessibility: Keyboard Navigation

Hard LO 4-4
LO 4-5

bottleneck

118) Rainier Inc. has 6,400 machine hours available each month. The following information on the company's three products is available:

	Product X	Product Y	Product Z
Contribution margin per unit	\$ 20.00	\$ 21.00	\$ 17.50
Machine hours per unit	2	3	2
Sales demand in units	1,000	1,500	1,500

MHs 2000 + 4500 + 3000 = 9500 MHs

Required:

- What production schedule will maximize the company's profits?
- What will be the maximum possible contribution margin?

6400 capacity
3100 MHs
Shortage

$\frac{20}{2} \downarrow$ CM per MH \$10
 $\frac{21}{3} \downarrow$ CM per MH \$7
 $\frac{\$17.50}{2} \downarrow$ CM per MH \$8.75

Preference

①

③

②

(a)

CM/unit \$20
 units x 1000

 CM \$20,000
 MHs 2000

\$17.50
 x 1500

 \$26,250
 3000

6400
 - 5000

 1400 MHs remaining
 $\frac{1400}{3} = 466 \text{ units}$

x \$21/unit CM

\$9,786

(b)

Max CM = \$20,000 + \$9,786 + \$26,250 = \$56,036

118) Answer:

a.

CM/hr for X: $\$20/2 = \10 ; Y: $\$21/3 = \7 ; Z: $\$17.50/2 = \8.75 ; X first, then Z, finally Y.

X: $1,000 \text{ units} \times 2 = 2,000 \text{ hrs}$; $6,400 - 2,000 = 4,400$ remaining; Z: $1,500 \times 2 = 3,000$ hrs;

$4,400 - 3,000 = 1,400$ hrs remaining; Y: $1,400/3 = 466$ units; X: 1,000; Y: 466; Z: 1,500.

b.

$(1,000 \times \$20) + (466 \times \$21) + (1,500 \times \$17.50) = \$56,036.$

Difficulty: 3 Hard

Topic: Use of Differential Analysis for Production Decisions; The Theory of Constraints

Learning Objective: 04-04 Understand how to apply differential analysis to production decisions.; 04-05 Understand the theory of constraints.

Bloom's: Analyze

AACSB: Analytical Thinking

Accessibility: Keyboard Navigation

Hard LO 4-4
LO 4-5

132) Mobley Company makes three products in a single facility. Data concerning these products follow:

	Product		
	A	B	C
Selling price per unit	\$ 70.00	\$ 92.40	\$ 85.90
Direct materials	\$ 34.00	\$ 50.50	\$ 56.90
Direct labor	\$ 21.40	\$ 24.00	\$ 14.80
Variable manufacturing overhead	\$ 1.20	\$ 0.60	\$ 0.50
Variable selling cost per unit	\$ 1.80	\$ 2.30	\$ 2.10
Mixing minutes per unit	1.20	0.80	0.40
Monthly demand in units	2,000	4,000	2,000

The mixing machines are potentially the constraint in the production facility. A total of 6,300 minutes is available per month on these machines. Direct labor is a variable cost in this company.

Required:

- a. How many minutes of mixing machine time would be required to satisfy demand for all three products?
- b. How much of each product should be produced to maximize net operating income? (Round off to the nearest whole unit.)
- c. Up to how much should the company be willing to pay for one additional hour of mixing machine time if the company has made the best use of the existing mixing machine capacity? (Round off to the nearest whole cent.)

over →

132) Answer:

a.

Demand on the mixing machine:

	Products			Total
	A	B	C	
Mixing minutes per unit	1.20	0.80	0.40	
Monthly demand in units	2,000	4,000	2,000	
Total minutes required	2,400	3,200	800	6,400

b.

Optimal production plan:

	Product		
	A	B	C
Selling price per unit	\$ 70.00	\$ 92.40	\$ 85.90
Direct materials	34.00	50.50	56.90
Direct labor	21.40	24.00	14.80
Variable manufacturing overhead	1.20	0.60	0.50
Variable selling cost per unit	1.80	2.30	2.10
Total variable cost per unit	58.40	\$ 77.40	74.30
Contribution margin per unit	\$ 11.60	\$ 15.00	\$ 11.60
Mixing minutes per unit	1.20	0.80	0.40
Contribution margin per minute	\$ 9.67	\$ 18.75	\$ 29.00
Rank in terms of profitability	3	2	1
Optimal production	1,917*	4,000	2,000

* $(6,300 - 800 - 3,200) = 2,300 / 1.20 = 1,917$ (rounded)

c.

The company should be willing to pay up to the contribution margin per minute for the marginal job, which is \$9.67.

Difficulty: 3 Hard

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Learning Objective: 04-04 Understand how to apply differential analysis to production decisions.; 04-05 Understand the theory of constraints.

Bloom's: Analyze

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Hard LO 4-2

144) Horton Corporation makes a range of products. The company's predetermined overhead rate is \$16 per direct labor-hour, which was calculated using the following budgeted data:

Variable manufacturing overhead
Fixed manufacturing overhead
Direct labor-hours

\$ 75,000 ^{DLHs} ÷ 25,000 = \$ 3.00/DLH
\$ 325,000
25,000

Management is considering a special order for 700 units of product 48 at \$64 each. The normal selling price of product 48 is \$75 and the unit product cost is determined as follows:

Direct materials
Direct labor
Manufacturing overhead applied
Unit product cost

\$ 37.00
18.00
16.00 ^{P.O.H.R.} ÷ 16/DLH = 1 DLH.
\$ 71.00

If the special order were accepted, normal sales of this and other products would not be affected. The company has ample excess capacity to produce the additional units. Assume that direct labor is a variable cost, variable manufacturing overhead is really driven by direct labor-hours, and total fixed manufacturing overhead would not be affected by the special order.

\$3 per unit VMOH

Required:

If the special order were accepted, what would be the impact on the company's overall profit? (CIMA adapted)

5 \$64
\$37 DM }
18 DL } 58
3 VMOH }
CM 6 × 700 units ordered = \$4,200 CM. } increase in profit

144) Answer: Direct materials, direct labor, and variable manufacturing overhead are relevant in this decision. Fixed manufacturing overhead is not relevant since it would not be affected by the decision. The variable portion of the manufacturing overhead rate is computed as follows:

Variable manufacturing overhead	\$ 75,000
÷ Direct labor-hours	25,000
= Variable portion of the predetermined overhead rate	\$ 3.00

The direct-labor hours per unit for the special order can be determined as follows:

Manufacturing overhead applied	\$ 16.00
÷ Predetermined overhead rate	\$ 16.00
= Direct labor-hours	1.00

Consequently, the variable manufacturing overhead for the special order would be:

Variable portion of the predetermined overhead rate	\$ 3.00
× Direct labor-hours	1.00
= Variable manufacturing overhead	\$ 3.00

Putting this all together:

Special order price	\$ 64.00
Variable costs:	
Direct materials	37.00
Direct labor	18.00
Variable manufacturing overhead	3.00
Total variable cost	58.00
Contribution margin per unit	\$ 6.00
× Units ordered	700
= Total increase in profit from the special order	\$ 4,200

Difficulty: 3 Hard

Topic: Differential Analysis and Pricing Decisions

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

Bloom's: Analyze; AACSB: Analytical Thinking; Accessibility: Keyboard Navigation