

- c. Depreciation of buses is due to obsolescence. Depreciation due to wear and tear is negligible.
- d. Liability insurance premiums are based on the number of buses in the company's fleet.
- e. Dropping the Historic Mansions bus tour would not allow BlueLine Tours to reduce the number of buses in its fleet, the number of bus drivers on the payroll, or the size of the maintenance and preparation staff.

Required:

1. Prepare an analysis showing what the impact will be on the company's profits if this tour is discontinued.
2. The company's tour director has been criticized because only about 50% of the seats on BlueLine's tours are being filled as compared to an industry average of 60%. The tour director has explained that BlueLine's average seat occupancy could be improved considerably by eliminating about 10% of its tours, but that doing so would reduce profits. Explain how this could happen.



PROBLEM 7-19 Sell or Process Further [LO 7-7]

(Prepared from a situation suggested by Professor John W. Hardy.) Abilene Meat Processing Corporation is a major processor of beef and other meat products. The company has a large amount of T-bone steak on hand, and it is trying to decide whether to sell the T-bone steaks as is or to process them further into filet mignon and New York cut steaks.

Management believes that a 1-pound T-bone steak would yield the following profit:

Wholesale selling price (\$2.25 per pound)	\$2.25
Less joint costs incurred up to the split-off point where	
T-bone steak can be identified as a separate product	1.70
Profit per pound	<u>\$0.55</u>

As mentioned above, instead of being sold as is, the T-bone steaks could be further processed into filet mignon and New York cut steaks. Cutting one side of a T-bone steak provides the filet mignon, and cutting the other side provides the New York cut. One 16-ounce T-bone steak cut in this way will yield one 6-ounce filet mignon and one 8-ounce New York cut; the remaining ounces are waste. The cost of processing the T-bone steaks into these cuts is \$0.20 per pound. The filet mignon can be sold for \$3.60 per pound, and the New York cut can be sold wholesale for \$2.90 per pound.

Required:

1. Determine the profit per pound from processing the T-bone steaks further into filet mignon and New York cut steaks.
2. Would you recommend that the T-bone steaks be sold as is or processed further? Why?



PROBLEM 7-20 Shutting Down or Continuing to Operate a Plant [LO 7-2]

(Note: This type of decision is similar to dropping a product line.)

Hallas Company manufactures a fast-bonding glue in its Northwest plant. The company normally produces and sells 40,000 gallons of the glue each month. This glue, which is known as MJ-7, is used in the wood industry to manufacture plywood. The selling price of MJ-7 is \$35 per gallon, variable costs are \$21 per gallon, fixed manufacturing overhead costs in the plant total \$230,000 per month, and the fixed selling costs total \$310,000 per month.

Strikes in the mills that purchase the bulk of the MJ-7 glue have caused Hallas Company's sales to temporarily drop to only 11,000 gallons per month. Hallas Company's management estimates that the strikes will last for two months, after which sales of MJ-7 should return to normal. Due to the current low level of sales, Hallas Company's management is thinking about closing down the Northwest plant during the strike.

If Hallas Company does close down the Northwest plant, fixed manufacturing overhead costs can be reduced by \$60,000 per month and fixed selling costs can be reduced by 10%. Start-up costs at the end of the shutdown period would total \$14,000. Because Hallas Company uses Lean Production methods, no inventories are on hand.

Required:

1. Assuming that the strikes continue for two months, would you recommend that Hallas Company close the Northwest plant? Explain. Show computations to support your answer.

2. At what level of sales (in gallons) for the two-month period should Hallas Company be indifferent between closing the plant or keeping it open? Show computations. (Hint: This is a type of break-even analysis, except that the fixed cost portion of your break-even computation should include only those fixed costs that are relevant [i.e., avoidable] over the two-month period.)

PROBLEM 7-21 Accept or Reject a Special Order [LO 7-4]

Pietarsaari Oy, a Finnish company, produces cross-country ski poles that it sells for €32 a pair. (The Finnish unit of currency, the euro, is denoted by €.) Operating at capacity, the company can produce 50,000 pairs of ski poles a year. Costs associated with this level of production and sales are given below:

	Per Pair	Total
Direct materials	€12	€ 600,000
Direct labor	3	150,000
Variable manufacturing overhead	1	50,000
Fixed manufacturing overhead	5	250,000
Variable selling expenses	2	100,000
Fixed selling expenses	4	200,000
Total cost	€27	€1,350,000

Required:

- The Finnish army would like to make a one-time-only purchase of 10,000 pairs of ski poles for its mountain troops. The army would pay a fixed fee of €4 per pair, and in addition it would reimburse the Pietarsaari Oy company for its unit manufacturing costs (both fixed and variable). Due to a recession, the company would otherwise produce and sell only 40,000 pairs of ski poles this year. (Total fixed manufacturing overhead cost would be the same whether 40,000 pairs or 50,000 pairs of ski poles were produced.) The company would not incur its usual variable selling expenses with this special order.
If the Pietarsaari Oy company accepts the army's offer, by how much would net operating income increase or decrease from what it would be if only 40,000 pairs of ski poles were produced and sold during the year?
- Assume the same situation as described in (1) above, except that the company is already operating at capacity and could sell 50,000 pairs of ski poles through regular channels. Thus, accepting the army's offer would require giving up sales of 10,000 pairs at the normal price of €32 a pair. If the army's offer is accepted, by how much will net operating income increase or decrease from what it would be if the 10,000 pairs were sold through regular channels?

PROBLEM 7-22 Make or Buy Decision [LO 7-3]

Bronson Company manufactures a variety of ballpoint pens. The company has just received an offer from an outside supplier to provide the ink cartridge for the company's Zippo pen line, at a price of \$0.48 per dozen cartridges. The company is interested in this offer because its own production of cartridges is at capacity.

Bronson Company estimates that if the supplier's offer were accepted, the direct labor and variable manufacturing overhead costs of the Zippo pen line would be reduced by 10% and the direct materials cost would be reduced by 20%.

Under present operations, Bronson Company manufactures all of its own pens from start to finish. The Zippo pens are sold through wholesalers at \$4 per box. Each box contains one dozen pens. Fixed manufacturing overhead costs charged to the Zippo pen line total \$50,000 each year. (The same equipment and facilities are used to produce several pen lines.) The present cost of producing one dozen Zippo pens (one box) is given below:

Direct materials	\$1.50
Direct labor	1.00
Manufacturing overhead	0.80*
Total cost	\$3.30

*Includes both variable and fixed manufacturing overhead, based on production of 100,000 boxes of pens each year.

Excel



Required:

1. Should Bronson Company accept the outside supplier's offer? Show computations.
2. What is the maximum price that Bronson Company should be willing to pay the outside supplier per dozen cartridges? Explain.
3. Due to the bankruptcy of a competitor, Bronson Company expects to sell 150,000 boxes of Zippo pens next year. As previously stated, the company presently has enough capacity to produce the cartridges for only 100,000 boxes of Zippo pens annually. By incurring \$30,000 in added fixed cost each year, the company could expand its production of cartridges to satisfy the anticipated demand for Zippo pens. The variable cost per unit to produce the additional cartridges would be the same as at present. Under these circumstances, how many boxes of cartridges should be purchased from the outside supplier and how many should be made by Bronson? Show computations to support your answer.
4. What qualitative factors should Bronson Company consider in determining whether it should make or buy the ink cartridges?

(CMA, adapted)



excel

PROBLEM 7-23 Close or Retain a Store [LO 7-2]

Thrifty Markets, Inc., operates three stores in a large metropolitan area. The company's segmented absorption costing income statement for the last quarter is given below:

Thrifty Markets, Inc. Income Statement For the Quarter Ended March 31				
	Total	Uptown Store	Downtown Store	Westpark Store
Sales	\$2,500,000	\$900,000	\$600,000	\$1,000,000
Cost of goods sold	<u>1,450,000</u>	<u>513,000</u>	<u>372,000</u>	<u>565,000</u>
Gross margin	<u>1,050,000</u>	<u>387,000</u>	<u>228,000</u>	<u>435,000</u>
Selling and administrative expenses:				
Selling expenses:				
Direct advertising	118,500	40,000	36,000	42,500
General advertising*	20,000	7,200	4,800	8,000
Sales salaries	157,000	52,000	45,000	60,000
Delivery salaries	30,000	10,000	10,000	10,000
Store rent	215,000	70,000	65,000	80,000
Depreciation of store fixtures	46,950	18,300	8,800	19,850
Depreciation of delivery equipment	<u>27,000</u>	<u>9,000</u>	<u>9,000</u>	<u>9,000</u>
Total selling expenses	<u>614,450</u>	<u>206,500</u>	<u>178,600</u>	<u>229,350</u>
Administrative expenses:				
Store management salaries	63,000	20,000	18,000	25,000
General office salaries*	50,000	18,000	12,000	20,000
Utilities	89,800	31,000	27,200	31,600
Insurance on fixtures and inventory	25,500	8,000	9,000	8,500
Employment taxes	36,000	12,000	10,200	13,800
General office expenses—other*	<u>25,000</u>	<u>9,000</u>	<u>6,000</u>	<u>10,000</u>
Total administrative expenses	<u>289,300</u>	<u>98,000</u>	<u>82,400</u>	<u>108,900</u>
Total operating expenses	<u>903,750</u>	<u>304,500</u>	<u>261,000</u>	<u>338,250</u>
Net operating income (loss)	<u>\$ 146,250</u>	<u>\$ 82,500</u>	<u>\$ (33,000)</u>	<u>\$ 96,750</u>

*Allocated on the basis of sales dollars.

**PROBLEM 7-27 Utilization of a Constrained Resource [LO 7-5, LO 7-6]**

The Brandilyn Toy Company manufactures a line of dolls and a doll dress sewing kit. Demand for the dolls is increasing, and management requests assistance from you in determining the best sales and production mix for the coming year. The company has provided the following data:

Product	Demand Next Year Unit	Selling Price Per Unit	Direct Materials	Direct Labor
Marcy	26,000	\$35.00	\$3.50	\$4.80
Tina	42,000	\$24.00	\$2.30	\$3.00
Cari	40,000	\$22.00	\$4.50	\$8.40
Lenny	46,000	\$18.00	\$3.10	\$6.00
Sewing kit . . .	450,000	\$14.00	\$1.50	\$2.40

The following additional information is available:

- The company's plant has a capacity of 150,000 direct labor-hours per year on a single-shift basis. The company's present employees and equipment can produce all five products.
- The direct labor rate of \$12.00 per hour is expected to remain unchanged during the coming year.
- Fixed costs total \$356,000 per year. Variable overhead costs are \$4.00 per direct labor-hour.
- All of the company's nonmanufacturing costs are fixed.
- The company's finished goods inventory is negligible and can be ignored.

Required:

- Determine the contribution margin per direct labor-hour expended on each product.
- Prepare a schedule showing the total direct labor-hours that will be required to produce the units estimated to be sold during the coming year.
- Examine the data you have computed in (1) and (2) above. How would you allocate the 150,000 direct labor-hours of capacity to Brandilyn Toy Company's various products?
- What is the highest price, in terms of a rate per hour, that Brandilyn Toy Company should be willing to pay for additional capacity (that is, for added direct labor time)?
- Identify ways in which the company might be able to obtain additional output so that it would not have to leave some demand for its products unsatisfied.

(CMA, adapted)

**PROBLEM 7-28 Sell or Process Further [LO 7-7]**

The Heather Honey Company purchases honeycombs from beekeepers for \$2.00 a pound. The company produces two main products from the honeycombs—honey and beeswax. Honey is drained from the honeycombs, and then the honeycombs are melted down to form cubes of beeswax. The beeswax is sold for \$1.50 a pound.

The honey can be sold in raw form for \$3.00 a pound. However, some of the raw honey is used by the company to make honey drop candies. The candies are packed in a decorative container and are sold in gift and specialty shops. A container of honey drop candies sells for \$4.40.

Each container of honey drop candies contains three quarters of a pound of honey. The other variable costs associated with making the candies are as follows:

Decorative container	\$0.40
Other ingredients	0.25
Direct labor	0.20
Variable manufacturing overhead	0.10
Total variable manufacturing cost	<u>\$0.95</u>

The plane would be sold after five years. Based on current resale values, the company would be able to sell it for about one-half of its original cost at the end of the five-year period.

Lease alternative. If the Zephyr II is leased, then the company would have to make an immediate deposit of \$50,000 to cover any damage during use. The lease would run for five years, at the end of which time the deposit would be refunded. The lease would require an annual rental payment of \$200,000 (the first payment is due at the end of Year 1). As part of this lease cost, the manufacturer would provide all servicing and repairs, license the plane, and pay all taxes. At the end of the five-year period, the plane would revert to the manufacturer, as owner.

Blinko Products' required rate of return is 18%.

Required:

(Ignore income taxes.)

1. Use the total-cost approach to determine the present value of the cash flows associated with each alternative.
2. Which alternative would you recommend that the company accept? Why?

PROBLEM 8-23 Simple Rate of Return and Payback Analysis of Two Machines [LO 8-5, LO 8-6]

Blue Ridge Furniture is considering the purchase of two different items of equipment, as described below:

Machine A. A machine has just come onto the market that compresses sawdust into various shelving products. Currently, the sawdust is disposed of as a waste product. The following information is available about the machine:

- a. The machine would cost \$780,000 and would have a 25% salvage value at the end of its 10-year useful life. The company uses straight-line depreciation and considers salvage value in computing depreciation deductions.
- b. The shelving products produced by the machine would generate revenues of \$350,000 per year. Variable manufacturing costs would be 20% of sales.
- c. Fixed annual expenses associated with the new shelving products would be: advertising, \$42,000; salaries, \$86,000; utilities, \$9,000; and insurance, \$13,000.

Machine B. A second machine has come onto the market that would automate a sanding process that is now done largely by hand. The following information is available about this machine:

- a. The new sanding machine would cost \$220,000 and would have no salvage value at the end of its 10-year useful life. The company would use straight-line depreciation.
- b. Several old pieces of sanding equipment that are fully depreciated would be disposed of at a scrap value of \$7,200.
- c. The new sanding machine would provide substantial annual savings in cash operating costs. It would require an operator at an annual salary of \$26,000 and \$3,000 in annual maintenance costs. The current, hand-operated sanding procedure costs the company \$85,000 per year.

Blue Ridge Furniture requires a simple rate of return of 16% on all equipment purchases. Also, the company will not purchase equipment unless the equipment has a payback period of four years or less.

Required:

(Ignore income taxes.)

1. For machine A:
 - a. Prepare an income statement showing the expected net operating income each year from the new shelving products. Use the contribution format.
 - b. Compute the simple rate of return.
 - c. Compute the payback period.
2. For machine B:
 - a. Compute the simple rate of return.
 - b. Compute the payback period.
3. According to the company's criteria, which machine, if either, should the company purchase?

PROBLEM 8-24 Simple Rate of Return; Payback [LO 8-5, LO 8-6]

Nagoya Amusements Corporation places electronic games and other amusement devices in supermarkets and similar outlets throughout Japan. Nagoya Amusements is investigating the purchase of a new electronic game called Mystic Invaders. The manufacturer will sell 20 games to Nagoya Amusements for a total price of ¥180,000. (The Japanese currency is the yen, which is denoted by



the symbol ¥.) Nagoya Amusements has determined the following additional information about the game:

- The game would have a five-year useful life and a negligible salvage value. The company uses straight-line depreciation.
- The game would replace other games that are unpopular and generating little revenue. These other games would be sold for a total of ¥30,000.
- Nagoya Amusements estimates that Mystic Invaders would generate annual incremental revenues of ¥200,000 (total for all 20 games). Annual incremental out-of-pocket costs would be (in total): maintenance, ¥50,000; and insurance, ¥10,000. In addition, Nagoya Amusements would have to pay a commission of 40% of total revenues to the supermarkets and other outlets in which the games were placed.

Required:

(Ignore income taxes.)

- Prepare a contribution format income statement showing the net operating income each year from Mystic Invaders.
- Compute the simple rate of return on Mystic Invaders. Will the game be purchased if Nagoya Amusements accepts any project with a simple rate of return greater than 14%?
- Compute the payback period on Mystic Invaders. If the company accepts any investment with a payback period of less than three years, will the game be purchased?

PROBLEM: 8–25 Net Present Value; Total and Incremental Approaches [LO 8–1]

Eastbay Hospital has an auxiliary generator that is used when power failures occur. The generator is worn out and must be either overhauled or replaced with a new generator. The hospital has assembled the following information:

	Present Generator	New Generator
Purchase cost new	\$16,000	\$20,000
Remaining book value	\$9,000	—
Overhaul needed now	\$8,000	—
Annual cash operating costs	\$12,500	\$7,500
Salvage value-now	\$4,000	—
Salvage value-eight years from now	\$3,000	\$6,000

If the company keeps and overhauls its present generator, then the generator will be usable for eight more years. If a new generator is purchased, it will be used for eight years, after which it will be replaced. The new generator would be diesel-powered, resulting in a substantial reduction in annual operating costs, as shown above.

The hospital computes depreciation on a straight-line basis. All equipment purchases are evaluated using a 16% discount rate.

Required:

(Ignore income taxes.)

- Should Eastbay Hospital keep the old generator or purchase the new one? Use the total-cost approach to net present value in making your decision.
- Redo (1) above, this time using the incremental-cost approach.



PROBLEM 8–26 Simple Rate of Return; Payback; Internal Rate of Return [LO 8–2, LO 8–5, LO 8–6]

Chateau Beaune is a family-owned winery located in the Burgundy region of France, which is headed by Gerard Despinoy. The harvesting season in early fall is the busiest part of the year for the winery, and many part-time workers are hired to help pick and process grapes. Mr. Despinoy is investigating the purchase of a harvesting machine that would significantly reduce the amount of labor required in the picking process. The harvesting machine is built to straddle grapevines, which are laid out in low-lying rows. Two workers are carried on the machine just above ground level, one on each side of the vine. As the machine slowly crawls through the vineyard, the workers

cut bunches of grapes from the vines, which then fall into a hopper. The machine separates the grapes from the stems and other woody debris. The debris are then pulverized and spread behind the machine as a rich ground mulch. Mr. Despinoy has gathered the following information relating to the decision of whether to purchase the machine:

- The winery would save €190,000 per year in labor costs with the new harvesting machine. In addition, the company would no longer have to purchase and spread ground mulch—at an annual savings of €10,000. (The French currency is the euro, which is denoted by the symbol €.)
- The harvesting machine would cost €480,000. It would have an estimated 12-year useful life and zero salvage value. The winery uses straight-line depreciation.
- Annual out-of-pocket costs associated with the harvesting machine would be insurance, €1,000; fuel, €9,000; and a maintenance contract, €12,000. In addition, two operators would be hired and trained for the machine, and they would be paid a total of €70,000 per year, including all benefits.
- Mr. Despinoy feels that the investment in the harvesting machine should earn at least a 16% rate of return.

Required:

(Ignore income taxes.)

- Determine the annual net savings in cash operating costs that would be realized if the harvesting machine were purchased.
- Compute the simple rate of return expected from the harvesting machine.
- Compute the payback period on the harvesting machine. Mr. Despinoy will not purchase equipment unless it has a payback period of five years or less. Under this criterion, should the harvesting machine be purchased?
- Compute (to the nearest whole percent) the internal rate of return promised by the harvesting machine. Based on this computation, does it appear that the simple rate of return is an accurate guide in investment decisions?

PROBLEM 8-27 Net Present Value Analysis of a New Product [LO 8-1]

Atwood Company has an opportunity to produce and sell a revolutionary new smoke detector for homes. To determine whether this would be a profitable venture, the company has gathered the following data on probable costs and market potential:

- New equipment would have to be acquired to produce the smoke detector. The equipment would cost \$100,000 and be usable for 12 years. After 12 years, it would have a salvage value equal to 10% of the original cost.
- Production and sales of the smoke detector would require a working capital investment of \$40,000 to finance accounts receivable, inventories, and day-to-day cash needs. This working capital would be released for use elsewhere after 12 years.
- An extensive marketing study projects sales in units over the next 12 years as follows:

Year	Sales in Units
1	4,000
2	7,000
3	10,000
4-12	12,000

- The smoke detectors would sell for \$45 each; variable costs for production, administration, and sales would be \$25 per unit.
- To gain entry into the market, the company would have to advertise heavily in the early years of sales. The advertising program follows:

Year	Amount of Yearly Advertising
1-2	\$70,000
3	\$50,000
4-12	\$40,000

Excel