



F O T A M A T

Check list

Video	Done	Comment
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Differential analysis: the key to decision Making

1

Six key concepts:

1-define the alternatives being considered.

2-identifying the criteria for choosing among them.

Only relevant and irrelevant cost/benefit

3-differential analysis.

Focusing on the future costs and benefits that **differ** between alternatives

Differential cost: a future cost that differs between any two alternatives, it is always relevant costs

Differential revenue: future revenue that differs between any two alternatives, it is relevant benefit

incremental cost: is an increase between any two alternatives

Avoidable cost: is a cost that can be eliminated by choosing one alternative over another

4-sunk cost: is a cost that has already been incurred and cannot be changed regardless of what a manager decides to do

Sunk cost has no effect on future cash flow, and remain the same no matter what alternatives are being considered.

5- future costs and benefits that do not differ between alternatives are irrelevant to the decision-making process

6- opportunity costs: is the potential benefit that is given up when one alternative is selected over another

financial advantaged/Differential benefits: when future cash inflows exceed differential costs " future cash outflows".

financial disadvantages: when differential benefits are less than its differential costs.

1	A cost that can be avoided by choosing one alternative over another is relevant for decision purposes.	TRUE
2	Sunk costs are never relevant in decision making.	TRUE
3	Future costs that do not differ between the alternatives in a decision are avoidable costs.	FALSE
4	Consistency demands that a cost that is relevant in one decision be regarded as relevant in other decisions as well.	FALSE
5	Sunk costs and future costs that do not differ between the alternatives may or may not be relevant in a decision.	FALSE
6	Fixed costs are sunk costs.	FALSE
7	Variable costs are always relevant costs in decisions.	FALSE
8	Sunk costs are costs that have proven to be unproductive.	FALSE
9	Fixed costs may be relevant in a decision.	TRUE
10	Avoidable costs are irrelevant costs in decisions.	FALSE
11	The book value of an old machine is always considered an opportunity cost in a decision.	FALSE
12	An avoidable cost is a sunk cost that can be eliminated (in whole or in part) as a result of choosing one alternative over another.	FALSE

1- Which of the following costs are always irrelevant in decision making?

- A) avoidable costs
- B) sunk costs**
- C) opportunity costs
- D) fixed costs

2- Costs that can be eliminated in whole or in part if a particular business segment is discontinued are called:

- A) sunk costs.
- B) opportunity costs.
- C) avoidable costs.**
- D) irrelevant costs.

2

Identifying relevant costs and benefits

A student in Boston wants to visit her friend in New York City over the weekend. She is trying to decide whether to drive or take the train. She wants the cheaper choice. The miles from her apartment to her friends is 230 miles. The miles from her apartment to her friends is 230 miles. She gathered information about the trip:

Automobile costs			
	Item	Annual cost of fixed items	Cost per mile (based on 10,000 miles per year)
1	Annual straight-line depreciation on car [(\$24,000 original cost - \$10,000 estimated residual value in 5 years) / 5 years]	\$2,800	\$0.280
2	Cost of gasoline (\$2.4 per gallon / 24 miles per gallon)		0.100
3	Annual cost of auto insurance and license	\$1,380	0.138
4	Maintenance and repairs		0.065
5	Parking fees at school	\$360	0.036
	Total average cost per mile		\$0.619

Additional data		
	item	
6	Reduction in the resale value of car due solely to wear and tear	\$0.080 per mile
7	Cost of round-trip train from Boston to New York city	\$114
8	Benefit of relaxing and being able to study during the train ride rather than having to drive	?
9	Cost of putting the dog in a kennel while gone	\$80
10	Benefit of having a car available in New York City	?
11	Hassle of parking the car in New York City	?
12	Cost of parking the car in New York City	\$25 per day

Which cost and benefits are relevant in this decision?

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3

Total cost approach

A company that is contemplating renting a new labor-saving machine for \$3,000 per year and will be used in the company's butcher clock production line. The following data concerns the company's annual sales and costs of butcher blocks with and without the new machine

	Current situation	Situation with the new machine
Units produced and sold	5,000	5,000
Selling price per unit	\$40	\$40
Direct material cost per unit	\$14	\$14
Direct labor cost per unit	\$8	\$5
Variable overhead cost per unit	\$2	\$2
Fixed expense, other	\$62,000	\$62,000
Fixed expense, rental for new machine	-	\$3,000

Compute the net operating income for the product under the two alternatives using full cost approach

	Current situation	Situation with new machine	Differential cost and benefits
Sales			

Under differential approach

4

Costs associated with two alternatives, code-named Q and R, being considered by Albiston Corporation are listed below:

	Alternative Q	Alternative R
Supplies costs	\$ 65,000	\$ 65,000
Power costs	\$ 30,000	\$ 29,000
Inspection costs	\$ 18,000	\$ 29,000
Assembly costs	\$ 33,000	\$ 33,000

Required:

- a. Which costs are relevant and which are not relevant in the choice between these two alternatives?
- b. What is the differential cost between the two alternatives?

Supplies costs	
Power costs	
Inspection costs	
Assembly costs	

	Alternative Q	Alternative R	Differential

1	A cost that will be incurred regardless of which alternative is selected is not relevant when choosing between the alternatives.	TRUE
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1- Which of the following would be relevant in the decision to sell or throw out obsolete inventory?

	Direct material cost assigned to the inventory	Fixed overhead cost assigned to the inventory
A)	Yes	Yes
B)	Yes	No
C)	No	Yes
D)	No	No

- A) Choice A
 B) Choice B
 C) Choice C
D) Choice D

2- Hodge Inc. has some material that originally cost \$74,600. The material has a scrap value of \$57,400 as is, but if reworked at a cost of \$1,500, it could be sold for \$54,400. What would be the financial advantage (disadvantage) of reworking and selling the material rather than selling it as is as scrap?

- A) (\$79,100)
 B) (\$21,700)
C) (\$4,500)
 D) \$52,900

3- Ouzts Corporation is considering Alternative A and Alternative B. Costs associated with the alternatives are listed below:

	Alternative A	Alternative B
Materials costs	\$ 40,000	\$ 56,000
Processing costs	\$ 37,000	\$ 37,000
Equipment rental	\$ 13,000	\$ 13,000
Occupancy costs	\$ 15,000	\$ 22,000

Are the materials costs and processing costs relevant in the choice between alternatives A and B?

- A) Both materials costs and processing costs are relevant
 B) Neither materials costs nor processing costs are relevant
 C) Only processing costs are relevant
D) Only materials costs are relevant

What is the financial advantage (disadvantage) of Alternative B over Alternative A?

- A) \$105,000
B) \$23,000
 C) \$128,000
 D) \$116,500

4- One of the employees of Davenport Corporation recently was involved in an accident with one of the corporation's delivery vans. The corporation is either going to repair the damaged van or sell it as is and buy a comparable used van. Information related to this decision is provided below:

Initial cost of the damaged van	\$30,000
Accumulated depreciation to date on van	\$18,000
Salvage value of van immediately before crash	\$9,000
Salvage value of van immediately after crash	\$1,000
Cost to repair damaged van	\$5,000
Cost of a comparable used van	\$10,000

Based on the information above, Davenport would be financially better off:

- A) \$1,000 by buying the comparable van.
- B) \$2,000 by buying the comparable van.
- C) \$2,000 by repairing the damaged van.
- D) \$4,000 by repairing the damaged van.**

5-The opportunity cost of making a component part in a factory with excess capacity for which there is no alternative use is:

- A) the variable manufacturing cost of the component.
- B) the total manufacturing cost of the component.
- C) the fixed manufacturing cost of the component.**
- D) zero.

6-The Tolar Corporation has 400 obsolete desk calculators that are carried in inventory at a total cost of \$26,800. If these calculators are upgraded at a total cost of \$10,000, they can be sold for a total of \$30,000. As an alternative, the calculators can be sold in their present condition for \$11,200.

The sunk cost in this situation is:

- A) \$10,000
- B) \$26,800**
- C) \$11,200
- D) \$0

What is the financial advantage (disadvantage) to the company from upgrading the calculators?

- A) \$8,800**
- B) (\$18,000)
- C) \$20,000
- D) (\$8,000)

Assume that Tolar decides to upgrade the calculators. At what selling price per unit would the company be as well off as if it just sold the calculators in their present condition?

- A) \$8 per calculator
- B) \$30 per calculator
- C) \$53 per calculator**
- D) \$67 per calculator

5

Adding and dropping product lines and other segments

Discount drug company

	Product line			
	total	Drugs	Cosmetics	Housewares
Sales	\$ 250,000	\$ 125,000	\$ 75,000	\$ 50,000
Variable expenses	105,000	50,000	25,000	30,000
Contribution margin	104,000	75,000	50,000	20,000
Fixed expenses				
Salaries	50,000	29,000	12,500	8,000
Advertising	15,000	1,000	7,500	6,500
Utilities	2,000	500	500	1,000
Depreciation -fixtures	5,000	1,000	2,000	2,000
Rent	20,000	10,000	6,000	4,000
Insurance	3,000	2,000	500	500
General administration	30,000	15,000	9,000	6,000
Total fixed expense	125,000	59,000	38,000	28,000
Net operating income (loss)	\$ 20,000	\$ 16,000	\$ 12,000	\$ (8,000)

1-the salaries expense represent salaries paid to employees working directly on the product. All of the employees working in housewares would be discharged if the product line is dropped.

2-the advertising expense represents advertisements that are specific to each product line and are avoidable if the line is dropped.

3-the utilities expense represents utilities costs for the entire company. The amount charged to each product line is an allocation based on space occupied and is not avoidable if the product line is dropped.

4- the depreciation expense represents depreciation on previously purchased fixtures that are used to display the various product lines. Although the fixtures are nearly new, they are custom built and will have no resale value if the houseware line is dropped.

5-the rent expense represents rent on the entire building housing the company; it is allocated to the product lines on the basis of sales dollars. The monthly rent of \$20,000 is fixed under a long-term lease agreement.

6-the insurance expense is for insurance carried on inventories within each of the three product lines. If housewares is dropped, the related inventories will be liquidated and the insurance premiums will decrease proportionately.

7-the general administrative expense represents the costs of accounting, purchasing, and general management, which are allocated to the product lines on the basis of sales dollars, these costs will not change if the houseware line is dropped.

Should the company drop or keep the housewares line?

Fixed expense	Total cost assigned to housewares	Not avoidable	avoidable
Salaries	\$ 8,000		
Advertising	6,500		
Utilities	1,000		
Depreciation – fixtures	2,000		
Rent	4,000		
Insurance	500		
General administrative	6,000		
Total	\$ 28,000		

Contribution margin lost if the housewares product line is discontinued	
Avoidable Fixed expense	
Financial disadvantages of dropping the housewares product line	

Comparative format

	Keep Housewares	Drop housewares	Difference: net operating income increase or (decrease)
Sales	\$ 50,000		
Variable expenses	30,000		
Contribution margin	20,000		
<u>Fixed expenses</u>			
Salaries	8,000		
Advertising	6,500		
Utilities	1,000		
Depreciation -fixtures	2,000		
Rent	4,000		
Insurance	500		
General administration	6,000		
Total fixed expense	28,000		
Net operating income (loss)	\$ (8,000)		

Traceable and common fixed cost

	Product line			
	total	Drugs	Cosmetics	Housewares
Sales	\$ 250,000	\$ 125,000	\$ 75,000	\$ 50,000
Variable expenses	105,000	50,000	25,000	30,000
Contribution margin	104,000	75,000	50,000	20,000
Traceable Fixed expenses				
Salaries	50,000	29,000	12,500	8,000
Advertising	15,000	1,000	7,500	6,500
Depreciation -fixtures	5,000	1,000	2,000	2,000
Insurance	3,000	2,000	500	500
Total traceable fixed expense	73,000	33,500	22,500	17,000
Product line segment margin	72,000	\$ 41,500	\$ 27,500	\$ 3,000
Common fixed expense				
Utilities	2,000			
Rent	20,000			
General administration	30,000			
Total common fixed expense	52,000			
Net operating income (loss)	\$ 20,000			

1	It may be a good decision to replace an asset before its original cost has been fully recovered through increased revenues or decreased costs.	TRUE
2	A cost that is traceable to a segment through activity-based costing is always an avoidable cost for decision making.	FALSE
3	A cost that is assigned to a product using activity-based costing may or may not be a relevant cost in a decision involving that product.	TRUE
4	The variable costs of a product are relevant in a decision concerning whether to eliminate the product.	TRUE
5	Fixed costs are irrelevant in decisions about whether a product should be dropped.	FALSE
6	A product whose revenues do not cover its variable costs and its traceable fixed costs should usually be dropped.	TRUE
7	In a decision to drop a product, the product should be charged for rent in proportion to the space it occupies even if the space has no alternative use and the rental payment is unavoidable.	FALSE

1) Lusk Corporation produces and sells 10,000 units of Product X each month. The selling price of Product X is \$40 per unit, and variable expenses are \$32 per unit. A study has been made concerning whether Product X should be discontinued. The study shows that \$70,000 of the \$120,000 in monthly fixed expenses charged to Product X would not be avoidable even if the product was discontinued. If Product X is discontinued, the annual financial advantage (disadvantage) for the company of eliminating this product should be:

- A) **(\$30,000)**
- B) \$30,000
- C) \$40,000
- D) (\$40,000)

2) Product U23N has been considered a drag on profits at Jinkerson Corporation for some time and management is considering discontinuing the product altogether. Data from the company's budget for the upcoming year appear below:

Sales	\$730,000
Variable expenses	\$350,000
Fixed manufacturing expenses	\$234,000
Fixed selling and administrative expenses	\$161,000

In the company's accounting system all fixed expenses of the company are fully allocated to products. Further investigation has revealed that \$144,000 of the fixed manufacturing expenses and \$93,000 of the fixed selling and administrative expenses are avoidable if product U23N is discontinued. The financial advantage (disadvantage) for the company of eliminating this product for the upcoming year would be:

- A) \$15,000
- B) \$143,000
- C) **\$(143,000)**
- D) \$(15,000)

3) The Cook Corporation has two divisions--East and West. The divisions have the following revenues and expenses:

	East	West
Sales	\$ 500,000	\$ 550,000
Variable costs	200,000	275,000
Traceable fixed costs	150,000	180,000
Allocated common corporate costs	135,000	170,000
Net operating income (loss)	<u>\$ 15,000</u>	<u>\$ (75,000)</u>

The management of Cook is considering the elimination of the West Division. If the West Division were eliminated, its traceable fixed costs could be avoided. Total common corporate costs would be unaffected by this decision. Given these data, the elimination of the West Division would result in an overall company net operating income (loss) of:

- A) \$15,000
- B) \$(155,000)**
- C) \$(75,000)
- D) \$(60,000)

4) Fabri Corporation is considering eliminating a department that has an annual contribution margin of \$35,000 and \$70,000 in annual fixed costs. Of the fixed costs, \$25,000 cannot be avoided. The annual financial advantage (disadvantage) for the company of eliminating this department would be:

- A) \$10,000**
- B) \$(10,000)
- C) \$35,000
- D) \$(35,000)

5) A study has been conducted to determine if one of the departments in Carry Corporation should be discontinued. The contribution margin in the department is \$80,000 per year. Fixed expenses charged to the department are \$95,000 per year. It is estimated that \$50,000 of these fixed expenses could be eliminated if the department is discontinued. These data indicate that if the department is discontinued, the yearly financial advantage (disadvantage) for the company would be:

- A) (\$15,000)
- B) \$15,000
- C) (\$30,000)**
- D) \$30,000

6) Kahn Corporation (a multi-product company) produces and sells 8,000 units of Product X each year. Each unit of Product X sells for \$10 and has a contribution margin of \$6. If Product X is discontinued, \$50,000 of the \$60,000 in annual fixed costs charged to Product X could be eliminated. The annual financial advantage (disadvantage) for the company of eliminating this product should be:

- A) \$2,000**
- B) (\$2,000)
- C) \$12,000
- D) (\$12,000)

7) Key Corporation is considering the addition of a new product. The expected cost and revenue data for the new product are as follows:

Annual sales	2,500 units
Selling price per unit	\$ 304
Variable costs per unit:	
Production	\$ 125
Selling	\$ 49
Avoidable fixed costs per year:	
Production	\$ 50,000
Selling	\$ 75,000
Allocated common fixed corporate costs per year	\$ 55,000

If the new product is added, the combined contribution margin of the other, existing products is expected to drop \$65,000 per year. Total common fixed corporate costs would be unaffected by the decision of whether to add the new product.

If the new product is added next year, the financial advantage (disadvantage) resulting from this decision would be:

- A) \$325,000
- B) \$200,000
- C) \$145,000
- D) \$135,000**

At what selling price would the new product be just breaking even?

- A) \$246 per unit
- B) \$250 per unit**
- C) \$232 per unit
- D) \$282 per unit

6

The management of Schmader Corporation is considering dropping product M12C. Data from the company's accounting system appear below:

Sales	\$550,000
Variable expenses	\$242,000
Fixed manufacturing expenses	\$215,000
Fixed selling and administrative expenses	\$132,000

All fixed expenses of the company are fully allocated to products in the company's accounting system. Further investigation has revealed that \$137,000 of the fixed manufacturing expenses and \$79,000 of the fixed selling and administrative expenses are avoidable if product M12C is discontinued.

Required:

- a. What is the net operating income earned by product M12C according to the company's accounting system?

b. Determine the financial advantage (disadvantage) for the company of dropping product M12C. Should the product be dropped?

1-The Draper Corporation is considering dropping its Doombug toy due to continuing losses. Data on the toy for the past year follow:

Sales of 15,000 units	\$ 150,000
Variable expenses	120,000
Contribution margin	<u>30,000</u>
Fixed expenses	40,000
Net operating loss	<u>\$ (10,000)</u>

If the toy were discontinued, Draper could avoid \$8,000 per year in fixed costs. The remainder of the fixed costs are not avoidable.

The annual financial advantage (disadvantage) for the company from discontinuing the production and sale of Doombugs would be:

- A) (\$30,000)
- B) \$10,000
- C) (\$22,000)**
- D) \$18,000

Assuming all other conditions stay the same, at what level of annual sales of Doombugs (in units) should Draper be indifferent between discontinuing Doombugs or continuing the production and sale of Doombugs?

- A) 20,000 units
- B) 18,000 units
- C) 6,000 units
- D) 4,000 units**

Suppose that if the Doombug toy is dropped, the production and sale of other Draper toys would increase so as to generate a \$16,000 increase in the contribution margin received from these other toys. If all other conditions are the same, the financial advantage (disadvantage) from discontinuing the production and sale of Doombugs would be:

- A) (\$6,000)**
- B) \$14,000
- C) (\$2,000)
- D) \$28,000

2) Balser Corporation manufactures and sells a number of products, including a product called JYMP. Results for last year for the manufacture and sale of JYMPs are as follows:

Sales		\$ 960,000
Less expenses:		
Variable production costs	\$ 464,000	
Sales commissions	144,000	
Salary of product manager	100,000	
Fixed product advertising	160,000	
Fixed manufacturing overhead	132,000	1,000,000
Net operating loss		\$ (40,000)

Balser is trying to decide whether to discontinue the manufacture and sale of JYMPs. All expenses other than fixed manufacturing overhead are avoidable if the product is dropped. None of the fixed manufacturing overhead is avoidable.

Assume that dropping Product JYMP will have no effect on other products. The annual financial advantage (disadvantage) for the company of eliminating this product should be:

- A) \$40,000
- B) (\$132,000)
- C) (\$92,000)**
- D) (\$172,000)

Assume that dropping Product JYMP would result in a \$90,000 increase in the contribution margin of other products. If Balser chooses to discontinue JYMP, the annual financial advantage (disadvantage) of eliminating this product should be:

- A) (\$40,000)
- B) \$40,000
- C) (\$2,000)**
- D) \$50,000

7

Make or buy decision

Mountain goat cycle is a company that makes a heavy-duty gear shifter that is installs on its most popular line of mountain bikes. The company's accounting department reports the following costs of making 8,000 shifters each year:

Cost of making shifters		
	Per unit	8,000 units
Direct materials	\$ 6	\$ 48,000
Direct labor	4	32,000
Variable overhead	1	8,000
Supervisor's salary	3	24,000
Depreciation of special equipment	2	16,000
Allocated general overhead	5	40,000
Total cost	\$ 21	\$ 168,000

Should the company buy or make the shifters ?

Total relevant costs – 8,000 units		
	<u>Make</u>	<u>buy</u>
Total cost		

Assume that the space now being used to make shifters could be used to produce a new cross-country bike that would generate a segment margin of \$ 60,000 per year. Under these conditions, Mountain goat cycle would be \$ 20,000 better off by choosing to buy the shifters from the outside supplier rather than making them and using the newly available space to produce the cross-country bike:

	make	buy

*Idle space that has no alternative use and has an opportunity cost of zero.

8

Recher Corporation uses part Q89 in one of its products. The company's Accounting Department reports the following costs of producing the 8,000 units of the part that are needed every year.

	Per Unit
Direct materials	\$ 8.10
Direct labor	\$ 4.40
Variable overhead	\$ 8.60
Supervisor's salary	\$ 3.20
Depreciation of special equipment	\$ 2.60
Allocated general overhead	\$ 1.30

An outside supplier has offered to make the part and sell it to the company for \$27.60 each. If this offer is accepted, the supervisor's salary and all of the variable costs, including direct labor, can be avoided. The special equipment used to make the part was purchased many years ago and has no salvage value or other use. The allocated general overhead represents fixed costs of the entire company. If the outside supplier's offer were accepted, only \$3,000 of these allocated general overhead costs would be avoided. In addition, the space used to produce part Q89 could be used to make more of one of the company's other products, generating an additional segment margin of \$16,000 per year for that product.

Required:

- Prepare a report that shows the financial impact of buying part Q89 from the supplier rather than continuing to make it inside the company.

- Which alternative should the company choose?

1	When a company is involved in more than one activity in the entire value chain, it is vertically integrated.	TRUE
2	A vertically integrated company is less dependent on its suppliers than a company that is not vertically integrated.	TRUE
3	A disadvantage of vertical integration is that by pooling demand for parts from a number of companies, a supplier may be able to enjoy economies of scale that result in higher quality and lower cost than if every company makes its own parts.	TRUE

1) McFarlain Corporation is presently making part U98 that is used in one of its products. A total of 7,000 units of this part are produced and used every year. The company's Accounting Department reports the following costs of producing the part at this level of activity:

	Per Unit
Direct materials	\$ 3.70
Direct labor	\$ 3.60
Variable overhead	\$ 1.40
Supervisor's salary	\$ 4.00
Depreciation of special equipment	\$ 3.90
Allocated general overhead	\$ 4.10

An outside supplier has offered to produce and sell the part to the company for \$17.10 each. If this offer is accepted, the supervisor's salary and all of the variable costs, including direct labor, can be avoided. The special equipment used to make the part was purchased many years ago and has no salvage value or other use. The allocated general overhead represents fixed costs of the entire company, none of which would be avoided if the part were purchased instead of produced internally.

If management decides to buy part U98 from the outside supplier rather than to continue making the part, what would be the annual financial advantage (disadvantage)?

- A) **(\$30,800)**
- B) \$25,200
- C) \$30,800
- D) (\$25,200)

In addition to the facts given above, assume that the space used to produce part U98 could be used to make more of one of the company's other products, generating an additional segment margin of \$24,000 per year for that product. What would be the financial advantage (disadvantage) of buying part U98 from the outside supplier and using the freed space to make more of the other product?

- A) **(\$6,800)**
- B) (\$1,200)
- C) \$24,000
- D) (\$49,200)

2) Melbourne Corporation has traditionally made a subcomponent of its major product. Annual production of 30,000 subcomponents results in the following costs:

Direct materials	\$ 250,000
Direct labor	\$ 200,000
Variable manufacturing overhead	\$ 190,000
Fixed manufacturing overhead	\$ 120,000

Melbourne has received an offer from an outside supplier who is willing to provide the 30,000 units of the subcomponent each year at a price of \$28 per unit. Melbourne knows that the facilities now being used to manufacture the subcomponent could be rented to another company for \$80,000 per year if the subcomponent were purchased from the outside supplier. There would be no effect of this decision on the total fixed manufacturing overhead of the company. Assume that direct labor is a variable cost.

If Melbourne decides to purchase the subcomponent from the outside supplier, the annual financial advantage (disadvantage) would be:

- A) \$120,000
- B) \$20,000
- C) (\$120,000)**
- D) (\$20,000)

At what price per unit charged by the outside supplier would Melbourne be indifferent between making or buying the subcomponent?

- A) \$29 per unit
- B) \$25 per unit
- C) \$21 per unit
- D) \$24 per unit**

3) The Jabba Corporation manufactures the "Snack Buster" which consists of a wooden snack chip bowl with an attached porcelain dip bowl. Which of the following would be relevant in Jabba's decision to make the dip bowls or buy them from an outside supplier?

	Fixed overhead cost that can be eliminated if the bowls are purchased from the outside supplier	The variable selling cost of the Snack Buster
A)	Yes	Yes
B)	Yes	No
C)	No	Yes
D)	No	No

- A) Choice A
- B) Choice B**
- C) Choice C
- D) Choice D

9

Kirsten Corporation makes 100,000 units per year of a part called a B345 gasket for use in one of its products. Data concerning the unit production costs of the B345 gasket follow:

Direct materials	\$ 0.15
Direct labor	0.10
Variable manufacturing overhead	0.13
Fixed manufacturing overhead	0.24
Total manufacturing cost per unit	\$ 0.62

An outside supplier has offered to sell Kirsten Corporation all of the B345 gaskets it requires. If Kirsten Corporation decided to discontinue making the B345 gaskets, 25% of the above fixed manufacturing overhead costs could be avoided. Assume that direct labor is a variable cost.

Required:

- a. Assume Kirsten Corporation has no alternative use for the facilities presently devoted to production of the B345 gaskets. If the outside supplier offers to sell the gaskets for \$0.46 each, should Kirsten Corporation accept the offer?

	Make	Buy

b. Assume that Kirsten Corporation could use the facilities presently devoted to production of the B345 gaskets to expand production of another product that would yield an additional contribution margin of \$10,000 annually. What is the maximum price Kirsten Corporation should be willing to pay the outside supplier for B345 gaskets?

1) Sharp Corporation produces 8,000 parts each year, which are used in the production of one of its products. The unit product cost of a part is \$36, computed as follows:

Variable production cost	\$ 16
Fixed production cost	20
Unit product cost	<u>\$ 36</u>

The parts can be purchased from an outside supplier for only \$28 each. The space in which the parts are now produced would be idle and fixed production costs would be reduced by one-fourth. Based on these data, the financial advantage (disadvantage) of purchasing the parts from the outside supplier would be:

- A) **\$24,000**
- B) (\$24,000)
- C) \$56,000
- D) (\$56,000)

2) Elly Industries is a multi-product company that currently manufactures 30,000 units of part MR24 each month for use in production of its products. The facilities now being used to produce part MR24 have a fixed monthly cost of \$150,000 and a capacity to produce 35,000 units per month. If Elly were to buy part MR24 from an outside supplier, the facilities would be idle, but its fixed costs would continue at 40% of their present amount. The variable production costs of Part MR24 are \$11 per unit.

If Elly Industries continues to use 30,000 units of part MR24 each month, it would realize a financial advantage by purchasing this part from an outside supplier only if the supplier's unit price is less than:

- A) **\$14 per unit**
- B) \$11 per unit
- C) \$16 per unit
- D) \$13 per unit

If Elly industries is able to obtain part MR24 from an outside supplier at a purchase price of \$10 per unit, the monthly financial advantage (disadvantage) of buying the part rather than making it would be:

- A) \$30,000
- B) \$180,000
- C) \$90,000
- D) **\$120,000**

10

Foto Company makes 50,000 units per year of a part it uses in the products it manufactures. The unit product cost of this part is computed as follows:

Direct materials	\$ 12.00
Direct labor	10.10
Variable manufacturing overhead	2.00
Fixed manufacturing overhead	14.10
Unit product cost	<u>\$ 38.20</u>

An outside supplier has offered to sell the company all of these parts it needs for \$37.30 a unit. If the company accepts this offer, the facilities now being used to make the part could be used to make more units of a product that is in high demand. The additional contribution margin on this other product would be \$310,000 per year.

If the part were purchased from the outside supplier, all of the direct labor cost of the part would be avoided. However, \$9.70 of the fixed manufacturing overhead cost being applied to the part would continue even if the part were purchased from the outside supplier. This fixed manufacturing overhead cost would be applied to the company's remaining products.

Required:

- a. How much of the unit product cost of \$38.20 is relevant in the decision of whether to make or buy the part?

b. What is the financial advantage (disadvantage) of purchasing the part rather than making it?

c. What is the maximum amount the company should be willing to pay an outside supplier per unit for the part if the supplier commits to supplying all 50,000 units required each year?

1) Ahrends Corporation makes 70,000 units per year of a part it uses in the products it manufactures. The unit product cost of this part is computed as follows:

Direct materials	\$ 17.80
Direct labor	19.00
Variable manufacturing overhead	1.00
Fixed manufacturing overhead	17.10
Unit product cost	\$ 54.90

An outside supplier has offered to sell the company all of these parts it needs for \$48.50 a unit. If the company accepts this offer, the facilities now being used to make the part could be used to make more units of a product that is in high demand. The additional contribution margin on this other product would be \$273,000 per year.

If the part were purchased from the outside supplier, all of the direct labor cost of the part would be avoided. However, \$8.20 of the fixed manufacturing overhead cost being applied to the part would continue even if the part were purchased from the outside supplier. This fixed manufacturing overhead cost would be applied to the company's remaining products.

How much of the unit product cost of \$54.90 is relevant in the decision of whether to make or buy the part?

- A) \$37.80 per unit
- B) \$46.70 per unit**
- C) \$54.90 per unit
- D) \$19.00 per unit

What is the financial advantage (disadvantage) of purchasing the part rather than making it?

- A) \$273,000
- B) (\$126,000)
- C) \$147,000**
- D) \$448,000

What is the maximum amount the company should be willing to pay an outside supplier per unit for the part if the supplier commits to supplying all 70,000 units required each year?

- A) \$50.60 per unit**
- B) \$3.90 per unit
- C) \$58.80 per unit
- D) \$54.90 per unit

11

Gottshall Inc. makes a range of products. The company's predetermined overhead rate is \$19 per direct labor-hour, which was calculated using the following budgeted data:

Variable manufacturing overhead	\$ 225,000
Fixed manufacturing overhead	\$ 630,000
Direct labor-hours	45,000

Component P0 is used in one of the company's products. The unit cost of the component according to the company's cost accounting system is determined as follows:

Direct materials	\$ 21.00
Direct labor	40.80
Manufacturing overhead applied	32.30
Unit product cost	\$ 94.10

An outside supplier has offered to supply component P0 for \$78 each. The outside supplier is known for quality and reliability. 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 this decision. Gottshall chronically has idle capacity.

Required:

Is the offer from the outside supplier financially attractive? Why?

12

Special order decision

Is a one-time order that is not considered part of the company's normal ongoing business.

Mountain goat cycles has just received a request from the Seattle police department to produce 100 specially modified mountains bikes at a price of \$ 558 each. Mountain goat cycles can easily modify its city cruiser model to fit the specifications of the Seattle police. The normal selling price of the city cruiser is \$ 698, and its unit product cost is \$ 564 as shown below:

Direct materials	\$ 372
Direct labor	90
Manufacturing overhead	102
Unit product cost	\$ 564

- The variable portion of the manufacturing overhead is \$ 12 per unit.
- The order would have no effect on the company's total fixed manufacturing overhead costs.
- The modifications would require brackets to hold radios, nightsticks and other gear. These modifications would require \$ 34 in incremental variable costs. In addition, the company would have to pay a graphic design studio \$ 2,400 to design and cut stencils that would be used for spray painting the Seattle police department's logo.
- The company's manager believe that this order will have no effect on the company's other sales and it can be produced without disrupting any of the company's regular scheduled production.

Should the company accept this special order?

	Per unit	Total 100 bikes

1	In a special order situation that involves using capacity that is not idle, opportunity costs are zero.	FALSE
2	In a special order situation, any fixed cost associated with the order would be irrelevant.	FALSE

1) Accepting a special order will improve overall net operating income if the revenue from the special order exceeds:

- A) the contribution margin on the order.
- B) the incremental costs associated with the order.**
- C) the variable costs associated with the order.
- D) the sunk costs associated with the order.

2) CoolAir Corporation manufactures portable window air conditioners. CoolAir has the capacity to manufacture and sell 80,000 air conditioners each year but is currently only manufacturing and selling 60,000. The following per unit numbers relate to annual operations at 60,000 units:

	Per Unit
Selling price	\$125
Manufacturing costs:	
Variable	\$25
Fixed	\$40
Selling and administrative costs:	
Variable	\$10
Fixed	\$15

The City of Clearwater would like to purchase 3,000 air conditioners from CoolAir but only if they can get them for \$75 each. Variable selling and administrative costs on this special order will drop down to \$2 per unit. This special order will not affect the 60,000 regular sales and it will not affect the total fixed costs. The annual financial advantage (disadvantage) for the company as a result of accepting this special order from the City of Clearwater should be:

- A) (\$21,000)
- B) \$24,000
- C) \$144,000**
- D) (\$129,000)

3) Hamby Corporation is preparing a bid for a special order that would require 780 liters of material W34C. The company already has 640 liters of this raw material in stock that originally cost \$8.30 per liter. Material W34C 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 \$7.60 per liter. New stocks of the material can be readily purchased for \$8.35 per liter. What is the relevant cost of the 780 liters of the raw material when deciding how much to bid on the special order?

- A) \$6,481
- B) \$6,376
- C) \$6,513**
- D) \$5,928

13

McNiff Corporation makes a range of products. The company's predetermined overhead rate is \$28 per direct labor-hour, which was calculated using the following budgeted data:

Variable manufacturing overhead	\$	180,000
Fixed manufacturing overhead	\$	380,000
Direct labor-hours		20,000

Management is considering a special order for 200 units of product O96S at \$122 each. The normal selling price of product O96S is \$149 and the unit product cost is determined as follows:

Direct materials	\$	67.00
Direct labor		32.00
Manufacturing overhead applied		44.80
Unit product cost	\$	<u>143.80</u>

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.

Required:

The financial advantage (disadvantage) for the company as a result of accepting this special order would be:

1) The following are Silver Corporation's unit costs of making and selling an item at a volume of 8,000 units per month (which represents the company's capacity):

Manufacturing:	
Direct materials	\$ 4
Direct labor	\$ 5
Variable overhead	\$ 2
Fixed overhead	\$ 8
Selling and administrative:	
Variable	\$ 1
Fixed	\$ 6

Present sales amount to 7,000 units per month. An order has been received from a customer in a foreign market for 1,000 units. The order would not affect regular sales. Total fixed costs, both manufacturing and selling and administrative, would not be affected by this order. The variable selling and administrative costs would have to be incurred for this special order as well as all other sales. Assume that direct labor is a variable cost.

Assume the company has 50 units left over from last year which have small defects and which will have to be sold at a reduced price for scrap. The sale of these defective units will have no effect on the company's other sales. Which of the following costs is relevant in this decision?

- A) \$11 variable manufacturing cost
- B) \$19 unit product cost
- C) \$1 variable selling and administrative cost**
- D) \$26 full cost

2) Landor Appliance Corporation makes and sells electric fans. Each fan regularly sells for \$42. The following cost data per fan is based on a full capacity of 150,000 fans produced each period.

Direct materials	\$ 8
Direct labor	\$ 9
Manufacturing overhead (70% variable and 30% unavoidable fixed)	\$ 10

A special order has been received by Landor for a sale of 25,000 fans to an overseas customer. The only selling costs that would be incurred on this order would be \$4 per fan for shipping. Landor is now selling 120,000 fans through regular channels each period. Assume that direct labor is an avoidable cost in this decision. What should Landor use as a minimum selling price per fan in negotiating a price for this special order?

- A) \$28 per fan**
- B) \$27 per fan
- C) \$31 per fan
- D) \$24 per fan

14

Juliani Company produces a single product. The cost of producing and selling a single unit of this product at the company's normal activity level of 50,000 units per month is as follows:

Direct materials	\$ 32.50
Direct labor	\$ 7.20
Variable manufacturing overhead	\$ 1.30
Fixed manufacturing overhead	\$ 20.90
Variable selling & administrative expense	\$ 1.90
Fixed selling & administrative expense	\$ 7.30

The normal selling price of the product is \$75.00 per unit.

An order has been received from an overseas customer for 3,000 units to be delivered this month at a special discounted price. This order would have no effect on the company's normal sales and would not change the total amount of the company's fixed costs. The variable selling and administrative expense would be \$0.30 less per unit on this order than on normal sales.

Direct labor is a variable cost in this company.

Required:

- Suppose there is ample idle capacity to produce the units required by the overseas customer and the special discounted price on the special order is \$65.60 per unit. What is the financial advantage (disadvantage) for the company next month if it accepts the special order?
- Suppose the company is already operating at capacity when the special order is received from the overseas customer. What would be the opportunity cost of each unit delivered to the overseas customer?
- Suppose there is not enough idle capacity to produce all of the units for the overseas customer and accepting the special order would require cutting back on production of 1,000 units for regular customers. What would be the minimum acceptable price per unit for the special order?

1)Elfalan Corporation produces a single product. The cost of producing and selling a single unit of this product at the company's normal activity level of 80,000 units per month is as follows:

	Per Unit
Direct materials	\$ 22.50
Direct labor	\$ 7.50
Variable manufacturing overhead	\$ 1.70
Fixed manufacturing overhead	\$ 19.00
Variable selling & administrative expense	\$ 2.70
Fixed selling & administrative expense	\$ 8.60

The normal selling price of the product is \$67.80 per unit.

An order has been received from an overseas customer for 3,000 units to be delivered this month at a special discounted price. This order would not change the total amount of the company's fixed costs. The variable selling and administrative expense would be \$1.90 less per unit on this order than on normal sales.

Direct labor is a variable cost in this company.

a- Suppose there is ample idle capacity to produce the units required by the overseas customer and the special discounted price on the special order is \$60.60 per unit. The monthly financial advantage (disadvantage) for the company as a result of accepting this special order should be:

- A) (\$4,200)
- B) \$84,300**
- C) (\$15,900)
- D) \$27,300

b- What is the contribution margin per unit on normal sales?

- A) \$7.20 per unit
- B) \$33.40 per unit**
- C) \$5.80 per unit
- D) \$7.70 per unit

c- Suppose there is not enough idle capacity to produce all of the units for the overseas customer and accepting the special order would require cutting back on production of 1,600 units for regular customers. The minimum acceptable price per unit for the special order is closest to:

- A) \$62.00 per unit
- B) \$50.70 per unit
- C) \$67.80 per unit
- D) \$50.31 per unit**

15

186) Kneller Co. manufactures and sells medals for winners of athletic and other events. Its manufacturing plant has the capacity to produce 12,000 medals each month; current monthly production is 9,600 medals. The company normally charges \$99 per medal. Cost data for the current level of production are shown below:

Variable costs:	
Direct materials	\$480,000
Direct labor	\$153,600
Selling and administrative	\$24,960
Fixed costs:	
Manufacturing	\$144,000
Selling and administrative	\$78,720

The company has just received a special one-time order for 500 medals at \$89 each. For this particular order, no variable selling and administrative costs would be incurred. This order would also have no effect on fixed costs. Assume that direct labor is a variable cost.

Required:

Should the company accept this special order? Why?

Answer: Only the direct materials and direct labor costs are relevant in this decision. To make the decision, we must compute the average direct materials and direct labor cost per unit.

Direct materials	\$ 480,000
Direct labor	153,600
Total	<u>\$ 633,600</u>
Current monthly production	9,600
Average direct materials and direct labor cost per unit	\$ 66

Because the price on the special order is \$89 per medal and the relevant cost is only \$66, the company would earn a profit of \$23 per medal. Therefore, the special order should be accepted.

1-The Melville Corporation produces a single product called a Pong. Melville has the capacity to produce 60,000 Pongs each year. If Melville produces at capacity, the per unit costs to produce and sell one Pong are as follows:

Direct materials	\$ 15
Direct labor	\$ 12
Variable manufacturing overhead	\$ 8
Fixed manufacturing overhead	\$ 9
Variable selling expense	\$ 8
Fixed selling expense	\$ 3

The regular selling price for one Pong is \$80. A special order has been received by Melville from Mowen Corporation to purchase 6,000 Pongs next year. If this special order is accepted, the variable selling expense will be reduced by 75%. However, Melville will have to purchase a specialized machine to engrave the Mowen name on each Pong in the special order. This machine will cost \$9,000 and it will have no use after the special order is filled. The total fixed manufacturing overhead and selling expenses would be unaffected by this special order. Assume that direct labor is a variable cost.

Assume Melville anticipates selling only 50,000 units of Pong to regular customers next year. If Mowen Corporation offers to buy the special order units at \$65 per unit, the annual financial advantage (disadvantage) for the company as a result of accepting this special order should be:

- A) \$60,000
- B) (\$90,000)
- C) \$159,000**
- D) \$36,000

Assume Melville anticipates selling only 50,000 units of Pong to regular customers next year. At what selling price for the 6,000 special order units would Melville be financially indifferent between accepting or rejecting the special order from Mowen?

- A) \$51.50 per unit
- B) \$49.00 per unit
- C) \$37.00 per unit
- D) \$38.50 per unit**

Assume Melville can sell 58,000 units of Pong to regular customers next year. If Mowen Corporation offers to buy the 6,000 special order units at \$65 per unit, the annual financial advantage (disadvantage) for Melville as a result of accepting this special order should be:

- A) \$36,000
- B) \$11,000**
- C) \$192,000
- D) \$47,000

2-Younes Inc. manufactures industrial components. One of its products, which is used in the construction of industrial air conditioners, is known as P06. Data concerning this product are given below:

	Per Unit
Selling price	\$ 220
Direct materials	\$ 38
Direct labor	\$ 1
Variable manufacturing overhead	\$ 8
Fixed manufacturing overhead	\$ 16
Variable selling expense	\$ 4
Fixed selling and administrative expense	\$ 16

The above per unit data are based on annual production of 4,000 units of the component. Assume that direct labor is a variable cost.

The company has received a special, one-time-only order for 400 units of component P06. **There would be no variable selling expense on this special order** and the total fixed manufacturing overhead and fixed selling and administrative expenses of the company would not be affected by the order. Assuming that Younes has excess capacity and can fill the order without cutting back on the production of any product, what is the minimum price per unit below which the company should not accept the special order?

- A) **\$47 per unit**
- B) \$83 per unit
- C) \$63 per unit
- D) \$220 per unit

The company has received a special, one-time-only order for 500 units of component P06. There would be no variable selling expense on this special order and the total fixed manufacturing overhead and fixed selling and administrative expenses of the company would not be affected by the order. However, assume that Younes has no excess capacity and this special order would require 30 minutes of the constraining resource, which could be used instead to produce products with a total contribution margin of \$10,000. What is the minimum price per unit below which the company should not accept the special order?

- A) **\$67 per unit**
- B) \$103 per unit
- C) \$20 per unit
- D) \$83 per unit

What is the current contribution margin per unit for component P06 based on its selling price of \$220 and its annual production of 4,000 units?

- A) \$51 per unit
- B) \$137 per unit
- C) **\$169 per unit**
- D) \$173 per unit

1) Munafo Corporation is a specialty component manufacturer with idle capacity. Management would like to use its extra capacity to generate additional profits. A potential customer has offered to buy 6,500 units of component VGI. Each unit of VGI requires 1 unit of material I57 and 5 units of material M97. Data concerning these two materials follow:

Material	Units in Stock	Original Cost Per Unit	Current Market Price Per Unit	Disposal Value Per Unit
I57	2,400	\$ 9.10	\$ 9.40	\$ 8.95
M97	33,960	\$ 4.70	\$ 4.70	\$ 3.50

Material I57 is in use in many of the company's products and is routinely replenished. Material M97 is no longer used by the company in any of its normal products and existing stocks would not be replenished once they are used up.

What would be the relevant cost of the materials, in total, for purposes of determining a minimum acceptable price for the order for product VGI?

- A) **\$174,850**
- B) \$213,130
- C) \$213,850
- D) \$171,925

2) Otool Inc. is considering using stocks of an old raw material in a special project. The special project would require all 240 kilograms of the raw material that are in stock and that originally cost the company \$2,112 in total. If the company were to buy new supplies of this raw material on the open market, it would cost \$9.25 per kilogram. However, the company has no other use for this raw material and would sell it at the discounted price of \$8.35 per kilogram if it were not used in the special project. The sale of the raw material would involve delivery to the purchaser at a total cost of \$71 for all 240 kilograms. What is the relevant cost of the 240 kilograms of the raw material when deciding whether to proceed with the special project?

- A) **\$1,933**
- B) \$2,004
- C) \$2,220
- D) \$2,112

3) Schickel Inc. regularly uses material B39U and currently has in stock 460 liters of the material for which it paid \$3,128 several weeks ago. If this were to be sold as is on the open market as surplus material, it would fetch \$5.95 per liter. New stocks of the material can be purchased on the open market for \$6.45 per liter, but it must be purchased in lots of 1,000 liters. You have been asked to determine the relevant cost of 760 liters of the material to be used in a job for a customer. The relevant cost of the 760 liters of material B39U is:

- A) **\$4,902**
- B) \$4,672
- C) \$4,522
- D) \$6,450

3) Milford Corporation has in stock 16,100 kilograms of material R that it bought five years ago for \$5.75 per kilogram. This raw material was purchased to use in a product line that has been discontinued. Material R can be sold as is for scrap for \$3.91 per kilogram. An alternative would be to use material R in one of the company's current products, S88Y, which currently requires 2 kilograms of a raw material that is available for \$7.60 per kilogram. Material R can be modified at a cost of \$0.77 per kilogram so that it can be used as a substitute for this material in the production of product S88Y. However, after modification, 4 kilograms of material R is required for every unit of product S88Y that is produced. Milford Corporation has now received a request from a company that could use material R in its production process. Assuming that Milford Corporation could use all of its stock of material R to make product S88Y or the company could sell all of its stock of the material at the current scrap price of \$3.91 per kilogram, what is the minimum acceptable selling price of material R to the company that could use material R in its own production process?

- A) \$0.88 per kg
- B) \$3.03 per kg
- C) \$4.57 per kg
- D) \$3.91 per kg**

THE END

Good luck