

TESTING CRITICAL THINKING SKILLS IN ACCOUNTING PRINCIPLES

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Abstract

This paper describes a method of testing critical thinking skills in an accounting principles course. Under this method, each testing period is divided into two parts. In the first part, students complete a traditional test with multiple choice questions and problems. This part of the exam is timed and all students complete the first part of the test before the second part begins. The second part of the exam is a critical thinking exercise called “The Challenge Problem.” The Challenge Problem relies on the material covered in class, but requires students to apply the material to a business scenario not covered in the textbook or class lecture. The Challenge Problem is 25 out of 125 total points for the exam. On some exams the grade for the Challenge Problem is assigned based on individual effort only; on other exams the Challenge Problem may be a team effort or alternatively a combination of individual and team work. The introduction of Challenge Problems into the exam is an opportunity to demonstrate to students the application of accounting principles material to common business scenarios and to test the critical thinking skills of students. Examples of Challenge Problems are presented in the Appendix.

Learning Objectives

- 1) To demonstrate the application of basic accounting principles to common business scenarios.
- 2) To test the student’s ability to apply the tools presented in the lecture to solve a new and unfamiliar business problem.
- 3) To work collaboratively to form solutions to the team challenge problems.

Core Competencies Addressed

- 1) The Broad Business Perspective Competency of Strategic/Critical Thinking
- 2) The Personal Competency of Problem Solving and Decision Making

Detailed Description of the Case/Activity

The activity described below is a method of testing critical thinking skills in an accounting principles course. This activity is called “The Challenge Problem.” The Challenge Problem was designed for a six-hour Integrated Accounting Principles course. This course combines the material from the traditional three-hour financial and managerial accounting principles courses into a single six-hour course. In addition, the financial and managerial accounting topics are integrated throughout the course to illustrate the role of accounting in the development of a business. The textbook for the course is *Accounting: Information for Business Decisions* (Cunningham, Nikolai, and Bazley, Updated 2e, Thomson, 2007). The Integrated Accounting Principles course is offered in two-day per week or three-day per week sections. For example, a section offered on Tuesdays and Thursdays would meet for two hours and forty-five minutes twice a week (e.g., 9:30am-12:15pm on Tuesdays and Thursdays). A section offered on Mondays, Wednesdays, and Fridays would meet for one-hour and fifty minutes three days per week

(e.g., 8:00-9:50am on Mondays, Wednesdays, and Fridays). The students in the Integrated Accounting Principles course are primarily freshmen and sophomores, and only a small percentage of these students plan to major in accounting.

The Challenge Problem was developed initially to make the best use of the class period for the exams in the Integrated Accounting Principles course. As the class period is twice the normal length of a traditional class period and the students are freshmen and sophomores, it was not practical to give a traditional exam that would last the entire class period. Alternatively, if only half of the class period were devoted to an exam, then the other half of the class period might not be productive. That is, if the exam were scheduled for the first part of class, the students would not be sharp and alert for new material presented in the second part of class. If the exam were scheduled for the second part of class, the students would not be attentive to the material presented in the first part of class because they would be focused on preparing for the exam.

The remedy for structuring the exams in this super-sized Integrated Accounting Principles course was to divide the exam into two parts. The first part of the exam has a traditional format with multiple choice questions and problems from the chapter readings and lectures. This part of the exam is timed and the questions are focused on the student's basic knowledge of the course material. The first part of the exam represents 100 points out of the 125 total possible points for each exam. All students complete the first part of the exam before the second part begins; and there is a 10-15 minute break scheduled between the first and second parts of the exam. The remaining 25 points of the exam are devoted to "The Challenge Problem." As the name implies, the Challenge Problem is harder than the questions included on the first part of the exam; and, it is designed to test the student's ability to apply the material from the first part of the exam to a new, unfamiliar problem. Each Challenge Problem represents a common, real world, business application for the material included on the first part of the exam. The students have not seen the Challenge Problem, or an example like it, prior to the exam. Therefore, they must employ critical thinking skills to formulate a solution to the problem. (Examples of Challenge Problems are presented in the Appendix.)

Some of the Challenge Problems are designed to be worked individually. Others are team challenges or can be assigned as a combination of individual and team efforts. The time allotted for the Challenge Problem depends upon whether the problem is to be worked individually, as a team, or a combination. Individual only or team only problems can be completed in 30-45 minutes. When the problem is a combination of individual work and team work, the students complete all, or part, of the problem individually; submit their individual work; and then complete the problem in teams of 3-4 members. The time needed for a Challenge Problem that is to be worked with a combination of individual and team work increases to approximately 45-60 minutes.

The grades for the Challenge Problems are awarded using the following scale.

A grade of 100% (25/25) = the solution represents a wholly correct response;

A grade of 70% (17.5/25) = a good effort was made to solve the problem and the problem was correct in most of its elements; and

A grade of 30% (7.5/25) = a reasonable effort was made to solve the problem.

When the Challenge Problem is assigned as a combination of individual and team work, the total 25 points are split between the two parts of the problem. For example, 10 points could be assigned to the

individual effort, and 15 points could be assigned to the team effort. Throughout the semester, the average grade on the Challenge Problems is 70% (17.5/25 points); however, most students will earn a grade of 100% (25/25) on at least one of the Challenge Problems. This results from the varied formats of the Challenge Problems. Some of the Challenge Problems are based on quantitative skills; others require qualitative analysis. Thus for students with weak quantitative skills but strong qualitative skills, there are Challenge Problems that allow those students to use their strengths. In addition, hopefully the experience of the Challenge Problems and the collaboration with other students on team challenges will help all students improve both their quantitative skills and qualitative analysis abilities.

The Challenge Problems have been used in the Integrated Accounting Principles course for two years (four semesters). Prior to the first exam, the students are a little apprehensive about what to expect from the Challenge Problem. By design, the Challenge Problem on the first exam is hard to set the appropriate level of expectation for the subsequent exams. In addition, the Challenge Problem on the first exam is structured as a combination of individual and team effort with 10 points allocated to individual work and 15 points to the team work. Across the four semesters, most of the students earn a grade of 70% (17.5/25 points) on the first Challenge Problem. However, in each class, there have been multiple teams of students who have earned a grade of 100% on the team portion of the problem. Some of these students worked the problem correctly individually and then influenced their team to formulate the correct answer. Alternatively, there are teams where no member's individual work was correct, but as team members they collaborated to formulate the correct answer. This latter result is indirect evidence that the team Challenge Problems create an important learning environment for students.

While the Challenge Problem was originally designed for the six-hour Integrated Accounting Principles class, this exercise could be used in any accounting course. The primary contributions of the Challenge Problem are: 1) they demonstrate the relevance of accounting skills in addressing common business problems; and, 2) they are an introductory step towards the development of critical thinking skills. The introduction of a Challenge Problem provides students with a different purpose for studying the course material and encourages them to think beyond merely memorizing formulas, or taking a cookbook-recipe approach to accounting. Thus, the Challenge Problem will hopefully help students break out of the mindset that "fair" questions on an exam are limited to the exact questions, with the same words, that were addressed in the lecture or assigned in the end-of-chapter homework problems. As future business leaders, the students will face business problems that will not come in the form of a multiple choice question with four well-defined alternatives from which to choose. Further, the business problems will not be accompanied with a blinking light announcing, for example, "This problem can be solved with breakeven analysis." To be successful, students must begin to develop critical thinking skills so that they can identify the appropriate tool to address the business problems they will encounter. The introduction of Challenge Problems into accounting principles exams is intended to be a first-step towards helping students develop the critical thinking skills that they will need to excel in the business world.

Authors' Biographies

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Dr. Young has held tax positions in both public accounting and private industry, working primarily on tax compliance and tax planning engagements for individuals, corporations, and pass-through entities. She

teaches accounting principles, tax courses and financial accounting theory. Her research interests include individual income tax policy and tax audit issues. She received her undergraduate and master's degrees from the University of Alabama and her doctorate in accounting from the University of Mississippi with minor field concentrations in taxation and economics.

Lee Warren, PhD

After receiving her B.A. from Randolph-Macon Woman's College and her M.B.A from Vanderbilt's Owen Graduate School of Management, Dr. Warren held several domestic and international positions at Cummins Engine Company. She then entered the financial services industry, serving as CFO and consultant for BMR Financial Group in Atlanta, Georgia. Dr. Warren earned her Ph.D. at the University of Georgia. She is active in AACSB International and the American Accounting Association. Her teaching interests in managerial accounting and corporate accounting derive from her professional experience and she is active in the development of service learning opportunities for Belmont students.

Appendix: Examples of Challenge Problems

Example 1: Using Breakeven Analysis to Make a Choice between Alternatives

Jupiter Travel is a charter airline service for corporate clients travelling between Chicago, Illinois and New York City, New York. The company leases one jet aircraft and flies an average of 140 one-way trips per year. Jupiter’s marketing strategy is to sell a more enjoyable travel experience than its rivals in the commercial airline industry. Jupiter arranges ground transportation in Chicago and New York City for its clients, offers a more spacious cabin with larger seats and more leg room, and serves gourmet meals on its flights. Jupiter does not sell its services to individuals; rather its services are marketed directly to corporate clients. Therefore, when Jupiter books a flight for a client, it is not merely selling a few seats on its aircraft. Rather, the corporate client is booking the use of the aircraft for its travel needs. Jupiter uses a network of commissioned travel agents to sell its services. These agents are not employees of Jupiter; and, the agents receive a 22% commission (no fixed salary) on each flight sold on Jupiter Travel. Jupiter had the following income statement for the year ending December 31, 2007.

Jupiter Travel Income Statement For the year ending 12/31/2007	
Sales Revenue (140 one-way flights * \$40,000 per flight)	\$5,600,000
Commissions Expense (22% of Sales Revenue)	1,232,000
Annual Lease Expense – Airplane	1,000,000
Annual Fee for Airport Ground Crew Services	800,000
Flight Crew Expense (140 one-way flights * \$1,500 per flight)	210,000
Fuel Expense (140 one-way flights * \$1,000 per flight)	140,000
Food Expense (140 one-way flights * \$800 per flight)	112,000
Ground Transportation Expense (140 one-way flights * \$200 per flight)	28,000
Other Fixed General & Administrative Expenses	150,000
Operating Income	1,928,000
Fixed Interest Expense	225,000
Net Income	1,703,000

- a) What is Jupiter’s current breakeven point?

- b) At the end of 2007, Jupiter’s management learned that its commissioned travel agents are demanding an increase in their commission rate to 25% per flight for the upcoming year. As a result, Jupiter’s president has decided to investigate the possibility of hiring an in-house sales staff to replace the commissioned travel agents. Jupiter’s accounting department compiled the following information to be used to evaluate the cost of establishing an in-house sales department.

Costs of Establishing an In-House Sales Department

The accounting department estimates that Jupiter would need to hire four salespeople at an average payroll cost of \$80,000 per employee to cover the workload of the current travel agents. Also, in order to hire highly-qualified individuals for these positions, the compensation package must include commissions. To be competitive with the industry-standard commission

rate, Jupiter must offer a 12% commission on each flight sold in addition to the salary. The cost of the in-house sales department will also include travel costs and support staff. Travel and entertainment expense is expected to total \$600,000 (fixed) for the year, and the annual cost of support staff positions will be fixed at \$150,000. Jupiter currently relies on the travel agents to sell its services. If Jupiter were to replace its commissioned travel agents with an in-house sales department, then it would have to bear more of the cost of advertising its services. In order to maintain the company's image and manage the transition from established travel agents to an in-house sales staff, the accounting department recommends spending \$500,000 (fixed) annually on advertising.

Use the December 31, 2007 Income Statement (with 140 flights sold) to estimate Jupiter's breakeven point in units (flights) if the company hires its own sales force and increases its advertising costs. Based on your answer, what amount of sales revenue would the company generate at this breakeven point?

- c) Assume that Jupiter decides not to hire its own sales force, but instead consents to give its current commissioned travel agents the raise they are demanding. How many flights must the company sell (with the new commission rate) to generate the same net income that was reported in 2007?
- d) Management must choose between: 1) hiring its own sales force and 2) compensating its current network of travel agents with a higher commission rate.
 - i. What is the profit formula for alternative 1), hiring an in-house sales force?
 - ii. What is the profit formula for alternative 2), increasing the commission rate of the current travel agents?
 - iii. At what level of sales volume (in flights) would management be indifferent between these two alternatives? (Indifference means the sales volume (units) that would produce the same profit between the alternatives.)
- e) Based on your calculations in a)-d), which alternative would you recommend to Jupiter's management? Briefly explain your answer.

Example 2: Internal Controls

This is based on a true story....

Over a twenty year period, the financial secretary of a local church stole \$900,000 from her congregation. When the embezzlement was announced, the members of the congregation sat in stunned silence. How could the leaders of the church overlook losses of this magnitude? There were years that the church had struggled to meet its financial obligations and the members of the congregation gave sacrificially to help the church pay its debts. How could a seemingly faithful member of the church steal from her friends and employer? In the weeks following the announcement, the sordid tale began to unfold. The opportunity for this fraud to occur was the result of a lack of separation of duties and an internal control structure failure. The following is a description of the church's accounting processes and the financial secretary's duties.

The church's primary source of income is contributions from the Sunday offering. Each Sunday volunteers serve as attendants to pass the contribution plates, and two deacons are responsible for placing the cash and checks from the offering into a zippered bag and putting the bag into the office safe. Only the two deacons and the secretary know the combination to the safe. During her tenure, the financial secretary would retrieve the offering from the safe each Monday. She was responsible for counting the offering, recording the contributions in the accounting records, preparing a deposit slip and taking the funds to the bank. In the course of counting the contributions, the financial secretary also kept track of the donations of individual members for tax reporting purposes.

The financial secretary paid and recorded all of the bills of the church. The administrative assistant opened all the mail and bills were forwarded directly to the financial secretary. When the financial secretary received the bills, she carefully reviewed them to determine if they were appropriate. In addition, she maintained a list of "approved" suppliers to help ensure that purchases were made at the lowest price and that church members' businesses were patronized whenever possible. When bills were paid, she determined the accounts in which each bill would be recorded, and wrote and signed the check for the payment. According to church policy, if a bill exceeded \$1,000, two signatures would be required on the check.

The financial secretary was also responsible for preparing all payroll checks and recording these amounts in the accounting records. All ministerial staff receive a fixed salary, and administrative, janitorial and kitchen staff are paid based on the number of hours worked during the pay period. The financial secretary reviewed the weekly time reports of the employees, applied the appropriate tax rates and determined the correct amount to pay the employees. In addition, she used these amounts to prepare all of the paychecks and the required tax payments for the tax withholding amounts. According to church policy, all paychecks require two signatures.

At the end of each month, the financial secretary prepared the financial statements for the church. These monthly statements were accompanied by year-to-date totals, comparisons to the monthly budget, comparisons to the prior year for the same month, and a thorough narrative explanation of the variances.

Each year the church's financial records were reviewed by an auditor. The auditing services were provided by a CPA who was also a member of the congregation. The auditor donated his services to the

church, and accordingly was not paid a fee for performing the audit. As the financial secretary enjoyed a long tenure in her position, she always correctly anticipated what the CPA needed to successfully complete the audit of the church records. She always had all the documents ready for his review, which made everything neat and easy for him.

Members of the church had come to rely on the competence and integrity of the financial secretary. She seemed tireless in her commitment and worked for a salary much less than they expected to pay someone with her expertise. In her own words, she “welcomed the opportunity to give back.”

Required:

The church was emotionally and financially devastated by the embezzlement perpetrated by the financial secretary. While the members were divided on what the appropriate level of punishment should be for the secretary, there was unanimous agreement that the church’s internal control procedures should be redesigned to minimize the likelihood that a fraud of this magnitude could happen again.

Evaluate the internal control structure of the church, and identify the strengths and weaknesses of the system. For each internal control strength that you identify, explain why the procedure strengthens the internal control system of the church. For each weakness that you identify, provide a recommendation for how the weakness could be corrected. Present your answer in complete sentences, and be as thorough and detailed as possible in your identification of strengths, weaknesses and recommendations. It is not sufficient to merely provide a list of internal control procedures, but rather you need to relate the internal control procedures specifically to the church setting described above.

Grading Scale:

100% (25/25) - The solution represents a wholly correct response including more than 3 strengths and more than 3 weaknesses with appropriate recommendations for the weaknesses.

70% (17.5/25) – The solution is a good effort and is correct in most of its elements measured by the identification of 3 strengths and 3 weaknesses with appropriate recommendations for the weaknesses.

30% (7.5/25) - The solution represents a reasonable effort but includes less than 3 strengths and/or less than 3 weaknesses and/or inadequate recommendations for the weaknesses.

Example 3: Choosing Between Full-Time Employees and Independent Contractors to Fill a Special Order

Festive Celebrations Inc. manufactures decorations for all holiday occasions. The company has many popular inventory items, but the best-selling item is a Christmas snowman. The sales price per snowman is \$30. In the past five years, the company has produced 25,000 snowmen per year. The company's non-labor manufacturing costs per snowman at this level of production are:

Direct materials	\$2.25
Variable overhead	\$5.50
Fixed overhead	\$12.00

Labor related costs:

There are 12 workers in the snowman division of Festive Celebrations. The retail customers of Festive Celebrations place their orders for snowmen in January, and the workers in the snowman division work from January through December to fill the orders. The workers in the snowman division receive an hourly wage of \$13.00, and it takes one worker one hour to manufacture a snowman. This labor rate does not include payroll taxes. The payroll tax rates for 2007 are provided below. The workers in the snowman division work 8 hour shifts, 5 days a week, for 50 weeks per year. The workers receive a two week paid vacation during the last two weeks of the year.

Payroll Tax Rates for 2007:

Social Security Tax (Employee): 6.2% on the first \$97,500 of wages
Social Security Tax (Employer): 6.2% on the first \$97,500 of wages
Medicare Tax (Employee): 1.45% on all wages
Medicare Tax (Employer): 1.45% on all wages
Unemployment Tax: 5.4% on the first \$7,000 of wages paid to each employee per year

Employees are paid weekly, and each employee has \$78 of federal income taxes withheld each week.

Orders for 2007:

In January 2007, Festive Celebrations received orders from its retail customers for 25,000 snowmen. In July 2007, the company received a request for 5,760 additional snowmen from a new customer. The company has 12 weeks to fill the order for the additional snowmen. This 12 week period would occur during the months of August, September and October. The additional snowmen can be manufactured using the existing capacity within the manufacturing plant. In addition, the company would not have to purchase any additional equipment to fill the order. The management of Festive Celebrations has identified the following three options for filling the order for the additional 5,760 snowmen.

Option 1: Use the employees of the snowman division to manufacture the additional snowmen. Under this option, the company would add another 8 hour shift to each day and require the existing employees in the snowman division to work 16 hours per day for five days a week for 12 weeks to fill the order. That is, each worker within the snowman division would work an extra 8 hours per day during the twelve week period. The first 8 hours per day would be devoted to filling the orders for the 25,000 snowmen requested from the company's established retail customers, and the second 8 hour shift would be devoted to filling the order for the additional 5,760 snowmen ordered by the new customer. Under the employment contract that Festive Celebrations has with its labor force, employees receive 1½

times their base hourly rate for working overtime. The labor contract defines overtime as working more than 40 hours within one five day period. If the company uses its existing employees to manufacture the additional snowmen, the direct material cost and overhead costs would not change.

Option 2: Hire independent contractors to manufacture the snowmen. Under this option, the company would add another 8 hour shift to each day and hire twelve independent contractors to work during this shift. This new shift would require the independent contractors to work 8 hour shifts, 5 days a week for twelve weeks to fill the order. As these workers would not be as skilled as the existing employees at assembling the snowmen, management has estimated that direct materials cost would be \$2.75 per snowman, and variable overhead costs would be \$5.80 per snowman. The independent contractors would be paid \$12.50 per hour. In addition, the company would hire an experienced line supervisor for this shift. If this option is chosen, a member of the company's board of directors has agreed to serve as the line supervisor. He would be paid \$8,000 to supervise production of the additional snowmen. The board member (line supervisor) would be an independent contractor.

Option 3: Buy the additional snowmen from another manufacturer. The management of Festive Celebrations has identified another manufacturer that can provide the company with the shell for the snowmen. Under this option, Festive Celebrations would purchase 5,760 shells from the manufacturer for \$15 per shell, and incur \$4,000 in shipping costs to have the shells delivered to Festive Celebrations' manufacturing facility. The employees of the snowmen division would then complete the snowmen. Management estimates that it would take one employee fifteen minutes to complete a snowman from the shell. This option would require \$1.20 per snowman in direct materials, and \$1.80 per snowman in variable overhead costs. Under this option, the company would add a 2 hour shift for each day for 12 weeks. That is, the employees of the snowman division would work 10 hours per day, 5 days a week for 12 weeks to complete the additional 5,760 snowmen. The first 8 hours per day would be devoted to filling the orders for the 25,000 snowmen requested from the company's established retail customers, and the additional 2 hours per day would be devoted to filling the order for the additional 5,760 snowmen ordered by the new customer.

Required: Determine the best option for Festive Celebrations to fill the order for 5,760 snowmen by compiling the following information:

- a) Identify the relevant costs of each option *for Festive Celebrations*.
- b) Based on your answer in a), calculate the total relevant cost of each option *for Festive Celebrations*.
- c) Based on your answers in a) and b), if you were the CEO of Festive Celebrations which option would you choose? Briefly explain your answer.
- d) At what level of production (in snowmen) would Festive Celebrations be indifferent between:
 - i) Options 1 & 2
 - ii) Options 2 & 3
 - iii) Options 1 & 3

Example 4: Recording Product-Related Transactions and Determining Product Costs for Multiple Jobs using a Job-Order Costing System

Acme Aviation is a manufacturer of commercial and military airplanes. The company builds each airplane to customers' unique specifications. Accordingly, Acme uses the job order costing method to account for its manufacturing operations. The company has an automated manufacturing process and applies overhead using machine hours. At the beginning of the year, management estimated that it would incur total factory overhead costs of \$12,600,000 during 2007 and that job orders would consume 40,000 machine hours for the year. During October 2007, the company completed two jobs: Job 1542 and Job 1543. The company had the following activity during October 2007.

Required: Record the transactions in the spreadsheet provided and answer the questions below.

- a) Acme made a purchase of \$765,000 of raw materials on credit.
- b) Acme issued \$267,000 of direct materials and \$16,000 of indirect materials into production for Job 1542.
- c) Acme issued \$375,000 of direct materials and \$9,000 of indirect materials into production for Job 1543.
- d) Employees worked 475 direct labor hours on Job 1542 and 520 direct labor hours on Job 1543. Employees earn \$20 per hour. All wages are paid in the month the work is performed.
- e) Acme incurred the following factory overhead costs in October:

Supervisors' salaries (paid in cash)	\$585,000
Depreciation on factory and equipment	\$ 95,000
Insurance on the factory building (paid in cash)	\$180,000
Property taxes (paid in cash)	\$140,000
- f) Total machine hours consumed for Job 1542 were 1,200. Total machine hours for Job 1543 were 1,450.
- g) Acme completed both jobs and transferred them to finished goods.
- h) Acme sold Job 1542 for \$950,000 cash and Job 1543 on credit for \$1,350,000.
- i) At the end of the month, the company closed the Factory overhead account.

Questions:

- 1) What is the product cost for Job 1542? _____
- 2) What is the product cost for Job 1543? _____
- 3) For the month of October, did the company over- or under-apply overhead? Identify an amount with your answer.

- 4) Based on the ending account balances from your spreadsheet after all of the transactions have been recorded, what amount of gross profit would be recorded on the income statement for the month ending October 31, 2007?

Solutions to the Challenge Problems (For Restricted Access)

Example 1: Using Breakeven Analysis to Make a Choice between Alternatives

- a) What is Jupiter's current breakeven point?

Total Fixed Costs:

Annual Lease Expense	\$1,000,000
Annual Fee for Airport Ground Crew Services	\$ 800,000
Other Fixed General & Administrative Expenses	\$ 150,000
Fixed Interest Expense	<u>\$ 225,000</u>
Total Fixed Costs	\$2,175,000

Total Variable Costs Per Flight:

Commissions Expense (.22 * 40,000)	\$8,800
Flight Crew Expense	\$1,500
Fuel Expense	\$1,000
Food Expense	\$ 800
Ground Transportation Expense	<u>\$ 200</u>
Total Variable Cost per Unit	\$12,300

Contribution Margin per Unit = \$40,000 (Sales Price) - \$12,300 (Variable Cost per Unit) = \$27,700

Breakeven (Flights): $\frac{\text{Total Fixed Costs}}{\text{Contribution Margin per Unit}} = \frac{\$2,175,000}{\$27,700} = 79 \text{ flights}$

- b) Use the December 31, 2007 Income Statement (with 140 flights sold) to estimate Jupiter's breakeven point in units (flights) if the company hires its own sales force and increases its advertising costs. Based on your answer, what amount of sales revenue would the company generate at this breakeven point?

Total Fixed Costs:

Annual Lease Expense	\$1,000,000
Annual Fee for Airport Ground Crew Services	\$ 800,000
Other Fixed General & Administrative Expenses	\$ 150,000
Fixed Interest Expense	\$ 225,000
Salary Expense (Salespeople: 4*\$80,000)	\$ 320,000
Travel & Entertainment Expense	\$ 600,000
Staff Support Expense	\$ 150,000
Advertising Expense	<u>\$ 500,000</u>
Total Fixed Costs	\$3,745,000

Variable Costs per Unit:

Commissions Expense (.12 * 40,000)	\$ 4,800
Flight Crew Expense	\$ 1,500
Fuel Expense	\$ 1,000
Food Expense	\$ 800
Ground Transportation Expense	<u>\$ 200</u>
Total Variable Cost per Unit	\$ 8,300

Contribution Margin per Unit = \$40,000 (Sales Price) - \$8,300 (Variable Cost per Unit) = \$31,700

Breakeven (Flights): $\frac{\text{Total Fixed Costs}}{\text{Contribution Margin per Unit}} = \frac{\$3,745,000}{\$31,700} = 119 \text{ flights}$

Sales Revenue at Breakeven = 119 flights * \$40,000 = \$4,760,000

- c) Assume that Jupiter decides not to hire its own sales force, but instead consents to give its current commissioned travel agents the raise they are demanding. How many flights must the company sell (with the new commission rate) to generate the same net income that was reported in 2007?

Total Fixed Costs:

Annual Lease Expense	\$1,000,000
Annual Fee for Airport Ground Crew Services	\$ 800,000
Other Fixed General & Administrative Expenses	\$ 150,000
Fixed Interest Expense	<u>\$ 225,000</u>
Total Fixed Costs	\$2,175,000

Total Variable Costs Per Flight:

Commissions Expense (.25 * 40,000)	\$10,000
Flight Crew Expense	\$ 1,500
Fuel Expense	\$ 1,000
Food Expense	\$ 800
Ground Transportation Expense	<u>\$ 200</u>
Total Variable Cost per Unit	\$13,500

Contribution Margin per Unit = \$40,000 (Sales Price) - \$13,500 (Variable Cost per Unit) = \$26,500

Flights to Achieve Same Profit: $\frac{\text{Total Fixed Costs} + \text{Target Profit}}{\text{Contribution Margin per Unit}} = \frac{\$2,175,000 + 1,703,000}{\$26,500} =$

= 147 Flights

d) Management must choose between: 1) hiring its own sales force and 2) compensating its current network of travel agents with a higher commission rate.

i. What is the profit formula for alternative 1), hiring an in-house sales force?

$$\text{Profit} = \$40,000(x) - \$8,300(x) - \$3,745,000 \quad \text{or}$$
$$\text{Profit} = \$31,700(x) - \$3,745,000$$

ii. What is the profit formula for alternative 2), increasing the commission rate of the current travel agents?

$$\text{Profit} = \$40,000(x) - \$13,500(x) - \$2,175,000 \quad \text{or}$$
$$\text{Profit} = \$26,500(x) - \$2,175,000$$

iii. At what level of sales volume (in flights) would management be indifferent between these two alternatives? (Indifference means the sales volume (units) that would produce the same profit between the alternatives.)

$$\$31,700(x) - \$3,745,000 = \$26,500(x) - \$2,175,000$$

$$X = 302 \text{ Flights}$$

e) Based on your calculations in a)-d), which alternative would you recommend to Jupiter's management? Briefly explain your answer.

As the indifference point is much higher than the current sales level, management cannot be indifferent between the two alternatives. The best option is the alternative with the lower breakeven point. In this scenario, option 2 (increasing the commission rate to existing travel agents) has a lower breakeven point than hiring a new sales force.

Breakeven for option 1 = 119 Flights

Breakeven for option 2 = $\$2,175,000 / \$26,500 = 83$ Flights

Example 2: Internal Controls

Evaluate the internal control structure of the church, and identify the strengths and weaknesses of the system. For each internal control strength that you identify, explain why the procedure strengthens the internal control system of the church. For each weakness that you identify, provide a recommendation for how the weakness could be corrected. Present your answer in complete sentences, and be as thorough and detailed as possible in your identification of strengths, weaknesses and recommendations. It is not sufficient to merely provide a list of internal control procedures, but rather you need to relate the internal control procedures specifically to the church setting described above.

Strengths:

- 1) Two deacons place contributions in the bag and put the bag in the safe. The two deacons can serve as a check on the other.
- 2) A limited number of employees know the combination to the safe.
- 3) All cash is kept in the safe.
- 4) The church maintains a list of “approved” suppliers to ensure the lowest price for purchases.
- 5) Two signatures are required on all payments over \$1,000.
- 6) All paychecks require two signatures.
- 7) The church financial records are audited each year.

Weaknesses:

- 1) The secretary is solely responsible for counting the money collected each Sunday. The deacons should count the money before placing the bag in the safe.
- 2) The secretary has physical custody of the cash and makes all of the entries into the accounting records. These tasks should be separated so that one employee handles the cash and another records the collections and payments.
- 3) There is no independent record of the bills received. The administrative assistant should make a list of the bills received before forwarding the bills to the financial secretary.
- 4) The secretary records and pays all of the bills, and she determines the accounts in which the payments will be recorded. There should be some oversight over the accounting system so that one person does not determine the accounts to be used for recording transactions. Further, more than one employee should be consulted for determining an “approved list” of suppliers, and the tasks of recording and paying the bills should be separated.
- 5) The CPA performing the audit donated his time each year, and the audit plan did not change from year to year. While the CPA’s donation of his services is admirable, it might compromise the amount of time that he would be willing to commit to the audit. Also, he is not independent and his personal relationship with the secretary and members of the church might compromise his judgment. The church should hire an auditor who is not a member of the church and pay the necessary professional fee for the service.
- 6) The secretary’s salary was below market value for the work she performed. Good internal control requires clearly defined job descriptions and an annual review of these descriptions. If these policies had been implemented, it might have led the church leadership to question why the secretary was willing to accept a low salary for the jobs that she performed. While some employees may truly hold an altruistic view of their work for the church, if this review had been performed, the church may have uncovered the accounting irregularities much sooner.

Example 3: Determine the best option for Festive Celebrations to fill the order for 5,760 snowmen by compiling the following information:

- a) Identify the relevant costs of each option *for Festive Celebrations*.
- b) Based on your answer in a), calculate the total relevant cost of each option *for Festive Celebrations*.
- c) Based on your answers a) and b), if you were the CEO of Festive Celebrations which option would you choose? Briefly explain your answer.
- d) At what level of production (in snowmen) would Festive Celebrations be indifferent between:
 - i) Options 1 & 2
 - ii) Options 2& 3
 - iii) Options 1 & 3

Relevant Costs for Each Option			
Additional Snowmen for Special Order	<u>Make with Employees</u> 5,760	<u>Make with Independent Contractors</u> 5,760	<u>Buy the Snowman</u> 5,760
<u>Relevant Costs</u>			
DM	2.25	2.75	1.20
DL	19.50	12.50	4.88
FICA tax	1.49		0.37
Variable FOH	5.50	5.80	1.80
Purchase Price for the Snowmen			15.00
Cost Per Snowman	28.74	21.05	23.25
Total Variable Relevant Costs	165,552.48	121,248.00	133,939.12
Total Relevant Fixed Costs		8,000.00	4,000.00
Total Relevant Costs	165,552.48	129,248.00	137,939.12

c) Least Costly Option: Option 2 - Make the Snowmen with Independent Contractors

d) Indifference Points:

i. Options 1 & 2: $\$28.74(x) = \$21.05(x) + \$8,000$
 $X = 1,039$ Snowmen

ii. Options 2 & 3: $\$21.05(x) + \$8,000 = \$23.25(x) + \$4,000$
 $X = 1,819$ Snowmen

iii. Options 1 & 3: $\$28.74(x) = \$23.25(x) + \$4,000$
 $X = 729$ Snowmen

Example 4: Recording Product-Related Transactions and Determining Product Costs for Multiple Jobs using a Job-Order Costing System

Required: Record the transactions in the spreadsheet provided and answer the questions below. The completed spreadsheet is presented on the following page. The beginning balances are given in the problem.

- a) Acme made a purchase of \$765,000 of raw materials on credit.
- b) Acme issued \$267,000 of direct materials and \$16,000 of indirect materials into production for Job 1542.
- c) Acme issued \$375,000 of direct materials and \$9,000 of indirect materials into production for Job 1543.
- d) Employees worked 475 direct labor hours on Job 1542 and 520 direct labor hours on Job 1543. Employees earn \$20 per hour. All wages are paid in the month the work is performed.
- e) Acme incurred the following factory overhead costs in October:

Supervisors' salaries (paid in cash)	\$585,000
Depreciation on factory and equipment	\$ 95,000
Insurance on the factory building (paid in cash)	\$180,000
Property taxes (paid in cash)	\$140,000
- f) Total machine hours consumed for Job 1542 were 1,200. Total machine hours for Job 1543 were 1,450. (Pre-Determined Overhead Rate = \$315/hour = \$12,600,000/40,000)
- g) Acme completed both jobs and transferred them to finished goods.
- h) Acme sold Job 1542 for \$950,000 cash and Job 1543 on credit for \$1,350,000.
- i) At the end of the month, the company closed the Factory overhead account.

Questions:

- 1) What is the product cost for Job 1542? $\$654,500 = (\$267,000(\text{DM}) + \$9500(\text{DL}) + \$378,000(\text{FOH}))$
- 2) What is the product cost for Job 1543? $\$842,150 = (\$375,000(\text{DM}) + \$10,400(\text{DL}) + \$456,750(\text{FOH}))$
- 3) For the month of October, did the company over- or under-apply overhead? Identify an amount with your answer.

\$190,250 under-applied – The difference between actual overhead (\$1,025,000) and applied overhead (\$834,750). These amounts are reported in the Factory Overhead Account in the attached spreadsheet.

- 4) Based on the ending account balances from your spreadsheet after all of the transactions have been recorded, what amount of gross profit would be recorded on the income statement for the month ending October 31, 2007?

Gross Profit = Sales – Cost of Goods Sold
 $\$613,100 = \$2,300,000 - \$1,686,900$

	Cash	Accounts Receivable	Raw Materials	Good In Process	Finished Goods	Factory Overhead	Factory Equipment	Accounts Payable	Owner's Capital	Sales	Cost of Goods Sold
Beg. Bal.	1,200,000	15,000	20,000				525,000	5,000	1,755,000		
a)			765,000					765,000			
b)			(283,000)	267,000		16,000					
c)			(384,000)	375,000		9,000					
d)	(19,900)			19,900							
e)	(905,000)					1,000,000	(95,000)				
f)				834,750		(834,750)					
g)				(1,496,650)	1,496,650						
h)	950,000	1,350,000			(1,496,650)					2,300,000	(1,496,650)
i)						(190,250)					(190,250)
Totals	1,225,100	1,365,000	118,000	0	0	0	430,000	770,000	1,755,000	2,300,000	(1,686,900)