

Business Decision Analysis Writing Task

In this assignment, you will analyze a business scenario using mathematical concepts to make informed decisions. You will apply various mathematical tools and calculations to help a fictional business owner determine the most profitable course of action.

The Assignment

Part 1: Scenario Analysis

You are a consultant for Maria's Boutique Bakery, a small business that specializes in artisanal baked goods. Maria is considering expanding her product line and needs to determine which new products will be most profitable. She has collected the following data:

Current Product Information:

- Specialty Cakes:
 - Selling price \$45
 - Production cost \$18
 - Current monthly sales 80 units
- Artisan Breads:
 - Selling price \$8
 - Production cost \$3
 - Current monthly sales 200 units
- Gourmet Cookies:
 - Selling price \$2.50
 - Production cost \$0.75
 - Current monthly sales 500 units

Potential New Products:

- Premium Pies:
 - Selling price \$28
 - Production cost \$12
 - Estimated monthly sales 60 units
- Gluten-Free Pastries:
 - Selling price \$6
 - Production cost \$2.75
 - Estimated monthly sales 150 units

Additional Information:

- Maria currently works 160 hours per month and has one part-time employee who works 80 hours per month
- New production equipment would cost \$5,000 with an expected useful life of 5 years
- Maria's monthly fixed costs (rent, utilities, etc.) are \$2,800

Using this information:

1. Calculate the profit margin percentage for each current and potential product.
2. Determine the current monthly profit for the bakery.
3. Calculate the break-even point (in units) for each of the potential new products.
4. If Maria can only add one new product line due to time constraints, which should she choose and why?

Part 2: Time and Resource Allocation

Maria has decided to add both new product lines but needs to determine the most efficient production schedule. She has gathered the following information about production time:

Product	Preparation Time (hours)	Baking Time (hours)	Decoration/Finishing (hours)
Specialty Cakes	0.75	0.5	1.25
Artisan Breads	0.5	0.3	0.2
Gourmet Cookies	0.2	0.15	0.1
Premium Pies	0.6	0.4	0.5
Gluten-Free Pastries	0.4	0.25	0.3

Given these time requirements:

1. Calculate the total production hours currently needed per month for existing products.
2. Determine how many additional hours would be needed to produce the estimated quantities of new products.
3. Create an optimal weekly production schedule that accommodates all products while minimizing overtime.
4. Analyze whether Maria should hire another part-time employee or invest in equipment that could reduce production time by 20%. Show calculations to support your recommendation.

Part 3: Financial Projections and Decision-Making

Assuming Maria implements your recommendations:

1. Create a projected monthly income statement for the bakery that includes all five product lines.
2. Calculate the expected return on investment (ROI) for the new equipment over a 1-year period.
3. Perform a sensitivity analysis that examines how profits would change if:
 - Materials costs increase by 10%
 - Sales of new products are 25% lower than projected
 - Fixed costs increase by \$300 per month
4. Based on your analysis, write a final recommendation to Maria that addresses the financial viability of her expansion plans and identifies the key risks and opportunities.

Your submission should include:

- All calculations shown clearly with appropriate formulas
- Graphs or charts that visually represent your break-even analysis and profit comparisons
- A well-organized production schedule that shows daily and weekly workflows
- A 1-2 page executive summary that highlights your key findings and recommendations
- Proper use of business math terminology throughout your analysis

Remember to:

- Show all your work and explain your reasoning
- Use appropriate business math formulas and concepts
- Consider both financial and operational factors in your analysis
- Provide specific, actionable recommendations based on your calculations

This assignment is worth 20 points. Your work will be assessed on mathematical accuracy, application of business math concepts, clarity of analysis, and the practicality of your recommendations.

Rubric

Criteria	Proficient	Developing	Not Evident	Points
Mathematical Analysis	All calculations are accurate with formulas clearly shown. Profit margins, break-even points, and financial projections are calculated correctly. Analysis demonstrates thorough understanding of business math concepts.	Most calculations are accurate with minor errors. Some formulas shown but may lack clarity. Basic understanding of business math concepts demonstrated but some applications may be inconsistent.	Significant errors in calculations. Formulas missing or incorrectly applied. Limited understanding of business math concepts evident.	___/6
Resource Allocation & Scheduling	Production schedule is comprehensive, realistic, and optimizes available resources. Time calculations are accurate and all constraints are considered. Recommendation regarding staffing vs. equipment is well-supported with calculations.	Production schedule addresses basic requirements but may not fully optimize resources. Time calculations contain minor errors. Recommendation regarding staffing vs. equipment is reasonable but support may be limited.	Production schedule is incomplete or unrealistic. Time calculations contain major errors. Recommendation regarding staffing vs. equipment lacks mathematical support.	___/5
Financial Analysis & Decision-Making	Financial projections are comprehensive and accurate. Sensitivity analysis thoroughly examines potential risks. Recommendations are specific, actionable, and directly tied to mathematical analysis.	Financial projections contain minor errors or omissions. Sensitivity analysis is present but limited in scope. Recommendations are generally sound but may not be fully supported by the analysis.	Financial projections contain major errors or are missing. Sensitivity analysis is superficial or absent. Recommendations are vague or disconnected from the mathematical analysis.	___/5

Communication & Organization	Analysis is exceptionally well-organized with clear explanations of all mathematical concepts and their business implications. Visual representations effectively support the analysis. Executive summary concisely captures key findings and recommendations.	Analysis is generally organized but some explanations may lack clarity. Visual representations are included but may not fully support the analysis. Executive summary present but may not highlight all key points.	Analysis is disorganized or difficult to follow. Visual representations are missing or ineffective. Executive summary is missing or fails to capture key findings.	___/4
Total				___/20