**Appendix C**

**Starting a Business**

Starting your own business can be exciting and daunting at the same time. Businesses use math when managing finances, determining production levels, designing products and packaging, and monitoring labor. A bakery can be a highly profitable and rewarding business. During this activity, you will apply the skills from Ch. 1 & 2 to navigate some of the issues facing bakery owners.

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|  **Initial Budget:**$80,000 loan from family$38,250 small business loan from bankAll loans to be repaid in 10 years |

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 **Application Practice**

Answer the following questions. Use Equation Editor when writing mathematical expressions or equations. First, save this file to your hard drive by selecting **Save As** from the **File** menu. Click the white space below each question to maintain proper formatting.

1.       You have recently found a location for your bakery and have begun implementing the first phases of your business plan. Your budget consists of an $80,000 loan from your family and a $38,250 small business loan. These loans must be repaid in full within 10 years.

a)       What integer would represent your total budget?

b)       Twenty-five percent of your budget will be used to rent business space and pay for utilities. Write an algebraic expression that indicates how much money will be spent on business space and utilities. Do not solve.

c)       How much money will rent and utilities cost? Explain how you arrived at this answer.

d)       Suppose an investor has increased your budget by $22,250. The investor does not need to be repaid. Rather, he becomes part owner of your business. Will the investor contribute enough money to meet the cost of rent and utilities? Support your answer, and write an equation or inequality that illustrates your answer.

e)       This equation illustrates your remaining funds after paying for rent and utilities. How much money is left? Explain how you arrived at your answer.

$38,250 + $80,000+ $22,250-0.25($80,000 + $38,250) =

­2.       You are trying to decide how to most efficiently use your oven. You do not want the oven running at a high temperature when it is not baking, but you also do not want to waste a lot of time waiting for the oven to reach the desired baking temperature.

The instruction manual on the industrial oven suggests your oven temperature will increase by 45 degrees Fahrenheit per minute. When the over is initially turned on, the temperature is 70 degrees Fahrenheit. What will the temperature of the oven be after 7 minutes? Write an expression and explain how you arrived at your answer.

3.       In your industrial oven, you bake two baking sheets with 12 scones each, two baking sheets with 20 cookies each, and one baking sheet with 2 scones and 10 cookies.

a)       Write an expression that illustrates the total cost of all baked goods in the scenario above using the variable *s* to represent the cost of scones and the variable *c* to represent the cost of cookies. Simplify your expression by combining like terms.

b)       Suppose you have decided to price the scones at $2.28 each and the cookies at $1.19 each. How much total revenue would result from selling all the scones and cookies baked in the oven at one time?

 c)       Yesterday your store earned $797.30 just from the sale of cookies. Write and solve an equation that represents how many cookies were sold.

 4.       Your profit *P* is determined by subtracting the cost *C* (the amount of money it costs to operate a business) from the revenue *R* (the amount of money you earn from selling your product). Profit can be represented algebraically by the equations:

**Profit=Revenue-Cost**

OR

***P* = *R* - *C***

a)       Rewrite the formula to solve for *C*.

b)       Suppose your profit for one day is $1,281, and the cost of running the business for the day is $1,463. What is the revenue for that day? Explain your answer.

5.       When managing a business, it is important to take inventory of where your money is spent. You have a monthly budget of $5,000. Refer to the table below and answer the questions that follow. Round your answers to the nearest tenth of a percent.

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| **Category** | **Cost** | **Percentage** |
| Labor | $1,835 |   |
| Materials |   | 18% |
| Rent/utilities |   | 25% |
| Miscellaneous | $1,015 |   |
| Total | $5,000 | 100% |

a)       What percentage of the total monthly budget is spent on labor?

b)       What percentage of the total monthly budget is spent on miscellaneous items?

c)       How much do materials cost monthly?

d)       How much do rent and utilities cost monthly?