

Part 1 – Choose a product or service that you would like to turn into a business? Conduct a survey of *at least 10 people* to determine the price that potential customers are willing and able to pay. Ask a question such as “What price would you be willing to pay for _____?”
Product or Service

Explain your business product or service:

Record survey results here or attach as a separate sheet:

Part 2 – Analyze the results of the survey by creating a cumulative frequency table, graph and an expression that shows how the price charged led to the demand for your product or service (or in other words, how the price effected the number of customers).

a) Table:

Price “x”	Demand “D(x)”

b) Graph:

c) Expression (Line of best fit):

Part 3 – Develop an expression that shows how the price charged determines the overall revenue. The expression should clearly show the price as a variable and the demand expression from **Part 2**.

Part 4 – Develop a function showing the overall profit as a function of the price charged. Profit is the overall revenue (see **Part 3**) minus overall expenses.

- a) Determine the expenses that you will have for your product or service (materials, production equipment, labor, etc.).

- b) Develop an expression that shows how the price charged determines the overall expenses. The expression should show the expenses from **Part 4a** and the demand expression from **Part 2**.

- c) Create an equation that shows how the profit is a function of the price charged. The expression should show the revenue expression from **Part 3** and the expenses expression from **Part 4b**. Simplify the function so that it is standard form $ax^2 + bx + c$.

- d) Use the profit function from **part 4c** to create a table and graph showing how different prices result in different profits. The graph should clearly show the prices that will result in \$0 of profit and the price that will lead to the maximum profit.

Price “x”	Profit “P(x)”

- e) Use the profit function from **Part 4c** and the quadratic

formula $x = \frac{-b}{2a} \pm \frac{\sqrt{b^2 - 4ac}}{2a}$ to calculate the vertex showing the price that will yield the maximum profit and confirm the prices that will lead to \$0 of profit.