

# Sales-Plan Project

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In this project you will choose a product that you would like to make and sell. Then you will use what you have learned about quadratic functions to make a marketing plan and develop cost, revenue, and profit functions for your product.

**Complete the following steps and write up a report containing the results.**

## Product description:

1. Choose a simple product that you would like to manufacture and sell. Describe your product. Include how the product will be packaged for sale. Will it be sold in single units, dozens, boxes of 100, etc.?

## Costs:

2. Describe the estimated yearly fixed costs in the production of this product (office/warehouse space, utilities, equipment or machinery, training, etc.)?
3. What is the total amount for the fixed costs?
4. Describe the costs that go into making each unit of your product?
5. Write a Cost function,  $C(x)$ , for  $x$  number of units.

## Revenue:

6. Determine a reasonable price for your product.
7. You will need to offer a quantity discount for your product to sell larger quantities to a retail store. This discount should be greater than 0% and less than 10 % of your price (per item, per bag, per case, or however it will be packaged for sale).  
*For example, suppose I choose to discount the price .5% per package that a store orders. At this discount, if a store orders 60 packages, then I will give them a 30% discount (so they will pay 70% of the retail price.)*  
Describe your discount. Write an algebraic expression for your discount based on  $x$  units to be sold.
8. Write a Revenue function,  $R(x)$ , for  $x$  number of units. (This will be a quadratic function)

## Profit:

9. Write a Profit function  $P(x)$ , for  $x$  number of units. Remember, Profit=Revenue-Costs
10. Find your break-even point(s) when Revenue=costs (or Profit=0). Show how you to find these algebraically.

## Graph and Analyze:

11. On graph paper, Graph  $C(x)$ ,  $R(x)$ , and  $P(x)$  neatly on the same axes. Or you may use [www.desmos.com](http://www.desmos.com) to create a nice graph of your functions. Adjust the scale to show positive zeros and any other key points.
12. Describe what the intersection points tell us about your sales plan.
13. Find your maximum profit algebraically and describe how this shows up in the graph.
14. **Conclusion:** Now that you have analyzed this sales plan, are there any costs, prices, or discounts that you would change if you were really going to use this plan?