

# Business Math Handout 2:

## Break-Even Graph: Making a Profit

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CALCULATORS: Casio: *fx-9750G Plus & CFX-9850G Series*

Name \_\_\_\_\_ Date \_\_\_\_\_

### Discussion

When a company invests a certain amount of money to develop a product, one way to investigate when the company will break even is by using graphs. As the product is ready for sales, it takes a certain amount of money per unit sold to maintain your company's expenses. With this information, you can calculate the amount of sales you will need to make in order to begin making a profit. In this activity, you will use a Casio calculator to determine break-even sales for a start-up company.

### Using the Calculator:

Company "Y" invests \$200,000 in one particular business venture and it costs them approximately \$20 per sale to continue the business. You can represent their cost for business by the equation  $\text{Cost} = 20 \times \# \text{Sales} + 200,000$ . The company decides to sell the product for \$75 a piece. The profit can be represented by the equation  $\text{Profit} = 75 \times \# \text{Sales}$ . Let's calculate the number of sales needed for Company "Y" to make a profit:

- Press the **AC/ON** button, the **MENU** button, and select **5** for **GRAPH**.
- For Y1 type **20 X,θ,T + 200000 EXE**.
- For Y2 type **75 X,θ,T EXE**.
- Set the viewing window by pressing **SHIFT F3** :
  - XMin: type **0 EXE**.
  - XMax: type **5000 EXE**.
  - Scale: type **500 EXE**.
  - YMin: **-1000 EXE**.
  - YMax: **500000 EXE**.
  - Scale: type **50000 EXE**.
  - Press **EXIT** to return to the previous screen.
- Press **F6** to draw the graphs. Two graphs will appear on the screen.
- Solve for the Break-Even Point:
  - Press **F5** for G-Solv and select **F5:ISCT**.
  - The calculator will trace to the point of intersection.



Company "Y" will have to make 3,637 sales to begin making a profit.

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(continued)

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### Practice Problems

Calculate the Break-Even point for the following company and answer the questions that follow:

Company 1:

Initial Investment: \$1,000,000

Cost to keep producing product: \$10 / unit

Sale price of product: \$50

How many sales will the company need to make to break even?

\_\_\_\_\_

After how many sales will they begin to make a profit?

\_\_\_\_\_

### *Analysis:*

What suggestions can you make to the company above to make the break-even point 'faster'?

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\_\_\_\_\_

### *Extension:*

Calculate the Break-Even point for the following companies and answer the questions that follow:

Company 2:

Monthly Investment: \$15,000

Cost to keep producing product: \$30 / unit

Sale price of product: \$50

How many sales does this company need to make to break-even each month?

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What suggestions do you make to this company?

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