

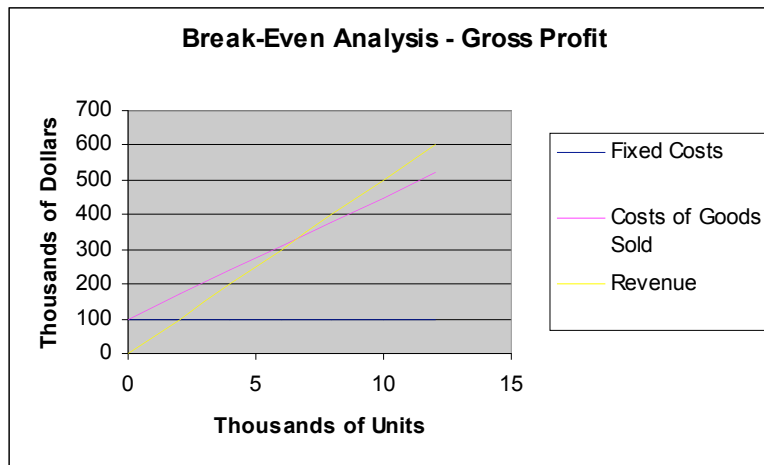
Name \_\_\_\_\_ Date \_\_\_\_\_

## Break-Even Analysis

In your business planning so far, have you ever asked the questions: How much do I have to sell to reach my gross profit goal? What price should I charge to cover my costs and allow for a planned amount of gross profit? How much does my gross profit change if I increase my sales by 10%? These are some of the questions that you can easily answer by doing a simple **break-even analysis**:

1. **Break-even analysis:** Mathematical analysis used to determine the sales level (units sold and revenue) at which the business neither incurs a loss nor makes a profit.
2. **Break even-point:** Occurs when the gross profit (or net income/loss) is equal to zero (Gross Profit = 0).

### Sample Break-Even Graph:



### Break-Even Point Equation:

$$\text{COGS} = \text{Revenue}$$

Or...

$$(\text{Variable Costs/Unit})(\text{Units}) + \text{Fixed Costs} = (\text{Price/Unit})(\text{Units})$$

**TO DO:**

1. Use the tables below to graph your revenue, cost of goods sold, and fixed costs. Include all three lines in one Excel graph titled "Break-even Analysis – Gross Profit".

x	y

**Revenue:**

x-axis: \_\_\_\_\_

y-axis: \_\_\_\_\_

m = \_\_\_\_\_

b = \_\_\_\_\_

linear equation: \_\_\_\_\_

x	y

**Cost of Goods Sold:**

x-axis: \_\_\_\_\_

y-axis: \_\_\_\_\_

m = \_\_\_\_\_

b = \_\_\_\_\_

linear equation: \_\_\_\_\_

x	y

**Fixed Costs:**

x-axis: \_\_\_\_\_

y-axis: \_\_\_\_\_

m = \_\_\_\_\_

b = \_\_\_\_\_

constant equation: \_\_\_\_\_

2. What is your break-even point?

• Revenue = \_\_\_\_\_

• Cost of Goods Sold = \_\_\_\_\_

- **Gross Profit** = \_\_\_\_\_
- **Units** = \_\_\_\_\_

**3. Calculate the number of units your company would need to sell to have the following gross profit margins (show your work for your first 2 calculations):**

**Gross Profit Margin** - A measurement of profitability; percentage of revenue that is applied to gross profit.

$$\text{Gross Profit Margin} = \frac{\text{Gross Profit}}{\text{Revenue}} \times 100\%$$

<b>Gross Profit Margin (%)</b>	<b>Gross Profit (\$)</b>	<b>Revenue (\$)</b>	<b>Units</b>
5			
10			
15			
20			
25			
30			
35			
40			

**4. Circle the row in the table above that corresponds to the number of units you hope to sell in the first year of your business.**

- Does the structure of your company support you reaching this goal? Why or why not?**
  
- Is your business capable of producing your desired number of units? Think about the number of hours it would require people to work in a year and remember that they only work approximately 246 days/year.**

**5. Now that you have run your first break-even analysis, it is time to look for ways to increase your profit margin. For example, you may be able increase your profit**

margin and still sell the same number of units to by lowering your COGS or increasing your revenue.

- Choose three adjustments that you can make to your business plan and repeat steps 1-4 of the break-even analysis.

A) ADJUSTMENT #1: \_\_\_\_\_

1. Use the tables below to graph your revenue, cost of goods sold and fixed costs.

x	y

**Revenue:**

**x-axis:** \_\_\_\_\_

**y-axis:** \_\_\_\_\_

**m =** \_\_\_\_\_

**b =** \_\_\_\_\_

**linear equation:** \_\_\_\_\_

x	y

**Cost of Goods Sold:**

**x-axis:** \_\_\_\_\_

**y-axis:** \_\_\_\_\_

**m =** \_\_\_\_\_

**b =** \_\_\_\_\_

**linear equation:** \_\_\_\_\_

x	y

**Fixed Costs:**

**x-axis:** \_\_\_\_\_

**y-axis:** \_\_\_\_\_

**m =** \_\_\_\_\_

**b =** \_\_\_\_\_

**constant equation:** \_\_\_\_\_


2. What is your break-even point?

- Revenue = \_\_\_\_\_
- Cost of Goods Sold = \_\_\_\_\_
- Gross Profit = \_\_\_\_\_
- Units = \_\_\_\_\_

3. Calculate the number of units your company would need to sell to have the following gross profit margins:

Gross Profit Margin (%)	Gross Profit (\$)	Revenue (\$)	Units
5			
10			
15			
20			
25			
30			
35			
40			

4. Circle the row in the table above that corresponds to the number of units you hope to sell in the first year of your business.

a) Does the structure of your company support you reaching this goal? Why or why not?

b) Is your business capable of producing your desired number of units?

B) ADJUSTMENT #2: \_\_\_\_\_

1. Use the tables below to graph your revenue, cost of goods sold and fixed costs.

x	y

Revenue:

x-axis: \_\_\_\_\_

y-axis: \_\_\_\_\_

m = \_\_\_\_\_


x	y

x	y

**Cost of Goods Sold:**

**x-axis:** \_\_\_\_\_

**y-axis:** \_\_\_\_\_

**m =** \_\_\_\_\_

**b =** \_\_\_\_\_

**linear equation:** \_\_\_\_\_

**Fixed Costs:**

**x-axis:** \_\_\_\_\_

**y-axis:** \_\_\_\_\_

**m =** \_\_\_\_\_

**b =** \_\_\_\_\_

**constant equation:** \_\_\_\_\_

2. What is your break-even point?

- Revenue = \_\_\_\_\_
- Cost of Goods Sold = \_\_\_\_\_
- Gross Profit = \_\_\_\_\_
- Units = \_\_\_\_\_

3. Calculate the number of units your company would need to sell to have the following gross profit margins:

<b>Gross Profit Margin (%)</b>	<b>Gross Profit (\$)</b>	<b>Revenue (\$)</b>	<b>Units</b>
--------------------------------	--------------------------	---------------------	--------------

5			
10			
15			
20			
25			
30			
35			
40			

4. Circle the row in the table above that corresponds to the number of units you hope to sell in the first year of your business.

a) Does the structure of your company support you reaching this goal? Why or why not?

b) Is your business capable of producing your desired number of units? (HINT: Look at direct materials and direct labor in your COGS tables!)

C) ADJUSTMENT #3: \_\_\_\_\_  
 \_\_\_\_\_

1. Use the tables below to graph your revenue, cost of goods sold and fixed costs. Include all three lines in one Excel graph titled "Break-even Analysis – Gross Profit".

x	y

Revenue:

x-axis: \_\_\_\_\_

y-axis: \_\_\_\_\_

m = \_\_\_\_\_

b = \_\_\_\_\_

linear equation: \_\_\_\_\_

x	y

Cost of Goods Sold:

x-axis: \_\_\_\_\_


<b>x</b>	<b>y</b>

**Fixed Costs:**

**x-axis:** \_\_\_\_\_

**y-axis:** \_\_\_\_\_

**m =** \_\_\_\_\_

**b =** \_\_\_\_\_

**constant equation:** \_\_\_\_\_

**2. What is your break-even point?**

- Revenue = \_\_\_\_\_
- Cost of Goods Sold = \_\_\_\_\_
- Gross Profit = \_\_\_\_\_
- Units = \_\_\_\_\_

**3. Calculate the number of units your company would need to sell to have the following gross profit margins:**

<b>Gross Profit Margin (%)</b>	<b>Gross Profit (\$)</b>	<b>Revenue (\$)</b>	<b>Units</b>
<b>5</b>			
<b>10</b>			
<b>15</b>			
<b>20</b>			
<b>25</b>			
<b>30</b>			
<b>35</b>			
<b>40</b>			



**4. Circle the row in the table above that corresponds to the number of units you hope to sell in the first year of your business.**

**a) Does the structure of your company support you reaching this goal? Why or why not?**

**b) Is your business capable of producing your desired number of units? (HINT: Look at direct materials and direct labor in your COGS tables!)**

**5. Review the adjustments that you made to your business plan. How did the break-even-analysis change the way you plan to set up your business?**