

# Breakeven



Accounting presentation created by  
Rex A Schildhouse  
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[www.schildhouse.com](http://www.schildhouse.com)

# Breakeven

- Breakeven is a business threshold value.
- Why operate a business at a loss?
- Breakeven is based on the contribution margin, the difference between the selling price and the variable cost of unit sold.

# Break-even

- For our example company here is the basic setup information.

Sales price per unit:	\$47.50
Variable expenses per unit:	\$22.75
Fixed expenses:	\$8,250.00
Target income from operations:	\$12,500.00
Units sold:	425

# Breakeven

- This is the income statement when our company is selling 425 units at \$47.50 per unit with a variable cost per unit sold of \$22.75 and fixed costs of \$8,250.

<b>Basic Income Statement to Operating Income</b>	
Sales revenues (\$47.50 sales price × 425 units)	\$20,187.50
Less: Variable expenses (\$22.75 per unit × 425 units)	9,668.75
Contribution margin:	10,518.75
Less: Fixed costs:	8,250.00
Operating income:	\$2,268.75

# Breakeven

- We want to know breakeven information and we want to know about a better income from operations.
- So we compute contribution margin, the difference between sales price and variable costs per unit.

<b>Contribution Margin Calculation:</b>	
Sales price per unit:	\$47.50
Less: Variable expenses per unit:	\$22.75
Contribution margin per unit:	\$24.75

# Breakeven

- With the contribution margin calculated we can compute breakeven in units.
- The math is fixed costs divided by contribution margin per unit.
- **WHEN THE RESULT IS A FRACTIONAL UNIT IT IS ALWAYS ROUNDED UP.**

Breakeven Calculation:					
Fixed costs:	\$8,250.00				
Divide by contribution margin per unit:	\$24.75				
Breakeven in units:	333.33			333.33	
Breakeven units rounded up:	334				
Sales price per unit:	\$47.50			\$47.50	
Breakeven in sales dollars:	\$15,865.00			\$15,833.33	

# Breakeven

- This rounding up is because, as in this case, selling 333 units will result in a loss.
- How many of your customer want to buy  $1/3^{\text{rd}}$  of a toaster or  $1/2$  of a car?

<b>Basic Income Statement to Operating Income</b>	
Sales revenues (\$47.50 sales price × 333 units)	\$15,817.50
Less: Variable expenses (\$22.75 per unit × 333 units)	7,575.75
Contribution margin:	8,241.75
Less: Fixed costs:	8,250.00
Operating income:	<b>(\$8.25)</b>

# Break-even

- When working with this issue, Microsoft Excel has a formula to help you out –  
“=roundup(value or cell reference, decimal places desired)”
- The check is the additional income from operations should not exceed variable cost per unit.

<b>Basic Income Statement to Operating Income</b>	
Sales revenues (\$47.50 sales price × 334 units)	\$15,865.00
Less: Variable expenses (\$22.75 per unit × 334 units)	7,598.50
Contribution margin:	8,266.50
Less: Fixed costs:	8,250.00
Operating income:	\$16.50



# Break-even

- When a target income from operations is introduced, it is effectively the same as a fixed expense.
- For clarity and personal preference, I have presented it as a separate value.

<b>Break-even Calculation with Target Income:</b>		
Fixed costs:	\$8,250.00	
Target income:	\$12,500.00	
Total fixed costs and target income:	\$20,750.00	
Divide by contribution margin per unit:	\$24.75	
Break-even in units:	838.38	838.38
Break-even units rounded up:	839	
Sales price per unit:	\$47.50	\$47.50
Break-even in sales dollars:	\$39,852.50	\$39,823.23

# Breakeven

- This target income from operations pushed total fixed costs up to  $(\$8,250 + \$12,500)$  \$20,750.
- The result is breakeven units is now 839 rounded up.

<b>Breakeven Calculation with Target Income:</b>		
Fixed costs:	\$8,250.00	
Target income:	\$12,500.00	
Total fixed costs and target income:	\$20,750.00	
Divide by contribution margin per unit:	\$24.75	
Breakeven in units:	838.38	838.38
Breakeven units rounded up:	839	
Sales price per unit:	\$47.50	\$47.50
Breakeven in sales dollars:	\$39,852.50	\$39,823.23

# Breakeven

- Breakeven in sales dollars is simple when working with this formula, Sales price per unit  $\times$  Sales units (rounded up).

<b>Breakeven Calculation with Target Income:</b>		
Fixed costs:	\$8,250.00	
Target income:	\$12,500.00	
Total fixed costs and target income:	\$20,750.00	
Divide by contribution margin per unit:	\$24.75	
Breakeven in units:	838.38	838.38
Breakeven units rounded up:	839	
Sales price per unit:	\$47.50	\$47.50
Breakeven in sales dollars:	\$39,852.50	\$39,823.23

# Breakeven

- This shows the difference between rounding up and rounding off those breakeven units.

<b>Breakeven Calculation with Target Income:</b>		
Fixed costs:	\$8,250.00	
Target income:	\$12,500.00	
Total fixed costs and target income:	\$20,750.00	
Divide by contribution margin per unit:	\$24.75	
Breakeven in units:	838.38	838.38
Breakeven units rounded up:	839	
Sales price per unit:	\$47.50	\$47.50
Breakeven in sales dollars:	\$39,852.50	\$39,823.23

# Breakeven

- Contribution Margin Ratio is the Contribution Margin per Unit  $\div$  Unit Sales Price.
- The result is a percentage which should be carried following rounding instructions.

<b>Contribution Margin Ratio Calculation:</b>	
Contribution margin per unit:	\$24.75
Sales price per unit:	\$47.50
Contribution margin ratio:	52.11%

# Breakeven

- With the fixed expenses of \$8,250 and a Contribution Margin Ratio of 52.11%, the breakeven in sales dollars is  $(\$8,250 \div 52.11\%)$  \$15,833.33.

<b>Contribution Margin Ratio Applied:</b>	
Fixed expenses:	\$8,250.00
Divide by contribution margin ratio:	52.11%
Breakeven in sales dollars:	\$15,833.33

# Breakeven

- To convert this to breakeven units divided the \$15,833.33 by sales price per unit, \$47.50, and get that fractional number of units of 333.33, which must be rounded up.

<b>Contribution Margin Ratio Applied:</b>	
Fixed expenses:	\$8,250.00
Divide by contribution margin ratio:	52.11%
Breakeven in sales dollars:	\$15,833.33

# Breakeven

- When we add the target income from operations of \$12,500 we end up with breakeven in sales dollars of \$39,823.23.
- Another value we have come close to before.
- This works out to be 838.38 units so we need to round it up to 839 units.

<b>Contribution Margin Ratio Applied:</b>	
Fixed expenses:	\$20,750.00
Divide by contribution margin ratio:	52.11%
Breakeven in sales dollars:	\$39,823.23



# Breakeven

- Breakeven is based on contribution margin per unit.
- If there is a target income from operations, it can be considered a fixed cost.
- All fractional units **MUST** be rounded up unless your company can sell a fractional unit.

# Breakeven

The end.