This guide covers how to determine breakeven price (or units) using the following tools:

- Use Goal Seek to Determine Breakeven Price (or Units).
- Build a Model to Determine Breakeven Price (or Units) using a Breakeven Calculation.
- Generate Multiple Breakeven Prices for Various Units using a One Variable Data Table.
- Use Vlookup() to Adjust Cost Per Unit as the Number of Units Changes.
- Create a Breakeven Chart

Breakeven Analysis Using Goal Seek

Breakeven is the point where your profit equals zero or in other words, when Total Sales – Total Costs = 0.
It is often helpful in determining the price you should charge for a new product or the number of units you must sell to breakeven. In these two exercises, we wish build a spreadsheet that shows what the *Profit* will be if we vary *Price* and *Units Sold*. We will then use Goal Seek to set *Profit* to 0 by changing either *Price* or *Units Sold*.

1. Create the "**Breakeven_GoalSeek**" sheet shown below.
   Given:
   - *Cost Per Unit* is $15 (i.e. it costs us $15 to make each unit).
   - *Fixed Costs for the time period we are producing our units*: $2000

   Formulas:
   - *Revenue*: Price * Units Sold =B5*B6
   - *Variable Cost*: Cost Per Unit * Units Sold =B8*B6
   - *Total Costs*: Variable Cost + Fixed Cost =B9+B10
   - *Profit*: Revenue – Total Costs =B7-B11

	A	B	C	D
1	**Break Even Analysis (Profit Goes to 0)**			
2	*If we produced 100 units, what price must we sell them at to break even?*			
3	*If Price is $20, how many units must we sell to break even?*			
4				
5	Price	**$10.00**		
6	Units Sold	**100**		
7	Revenue	$ 1,000.00	←	=B5*B6
8	Cost Per Unit ($15)	$ 15.00		
9	Variable Cost	$ 1,500.00	←	=B8*B6
10	Fixed Costs ($2000)	$ 2,000.00		
11	Total Costs	$ 3,500.00	←	=B9+B10
12	Profit	$ (2,500.00)	←	=B7-B11

3. Type some test values into **Price** (B5) and **Units Sold** (B6). Profit should update as you vary B5 & B6. Our goal is to keep one of these two cells constant and adjust the other until *Profit* goes to zero.

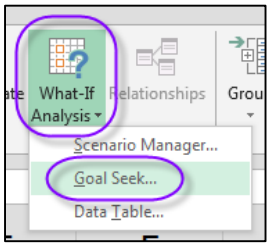
Using Goal Seek to Set Profit to Zero

The good news is that you don't have to keep typing in trial numbers until you arrive at one that sets *Profit* to zero; *Goal Seek* can do the algebra and find either the *Price* or *Units Sold* that will set *Profit* to zero for us. Note that for Goal Seek to accomplish this, there must be a mathematical relationship between *Profit* and *Units Sold* and *Price*. In other words, *Profit* must be a formula cell and *Price* and *Units Sold* must be data cells that are either directly or directly referenced by the *Profit* formula. If manually changing either *Price* or *Units Sold* does not change *Profit* then you cannot use Goal Seek.

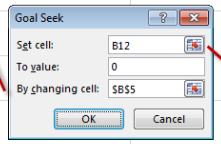
Goal Seek Exercise 1: Determine Breakeven Price if we Sell 100 Units

If we produce (and sell) 100 units, what must price be to break even?

a. In Price (B5) type **0** and in Units Sold (B6) type **100**.
b. Click in cell **B12**.
c. From the menu click "**Data**" – "**What if Analysis – Goal Seek…**"



	A	B	C	D	E	F
1	**Break Even Analysis (Profit Goes to 0)**					
2	*If we produced 100 units, what price must we sell them at to break even?*					
3	*If Price is $20, how many units must we sell to break even?*					
4						
5	Price	**$35.00**				
6	Units Sold	**100**				
7	Revenue	$	3,500.00			
8	Cost Per Unit ($15)	$	15.00			
9	Variable Cost	$	1,500.00			
10	Fixed Costs ($2000)	$	2,000.00			
11	Total Costs	$	3,500.00			
12	Profit	$	-			
13						



d. Set the following:
   Set Cell → **B12**
   To Value → **0**
   By changing cell → **B5**
e. Click "**OK**".

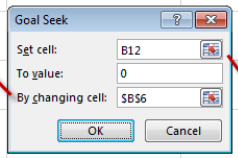
At 100 Units you must set the Price to $35 to break even.

Goal Seek Exercise 2: Determine Breakeven Units if Price is set at $20

If price is set at $20, how many units must we sell to break even?

a. In Price (B5) type **20** and in Units Sold (B6) type **10** (or some other number).
b. Click in cell **B12**.
c. From the menu click "**Data**" – "**What if Analysis – Goal Seek…**"

	A	B	C	D	E
1	**Break Even Analysis (Profit Goes to 0)**				
2	*If we produced 100 units, what price must we sell them at to break even?*				
3	*If Price is $20, how many units must we sell to break even?*				
4					
5	Price	**$20.00**			
6	Units Sold	**400**			
7	Revenue	$	8,000.00		
8	Cost Per Unit ($15)	$	15.00		
9	Variable Cost	$	6,000.00		
10	Fixed Costs ($2000)	$	2,000.00		
11	Total Costs	$	8,000.00		
12	Profit	$	-		



d. Set the following:
   Set Cell → **B12**
   To Value → **0**
   By changing cell → **B6**
e. Click "**OK**".

At a price of $20 you must sell 400 units to break even.

Calculate Multiple Breakeven Prices – One Variable Data Table

In the previous exercises we determined a breakeven price based on a 100 units sold. In this section we will look at how to create a table of breakeven prices for various numbers of units sold. Specifically, we wish to build the table below.

	A	B	C	D	E
1	**Break Even Analysis (Profit = 0)**				
2	*What Should Price be to break even if we vary Units?*			**Units Varied**	
3				Units	Prices Are:
4		**Units Varied**			$55.00
5	Price	$ 55.00		50	$55.00
6	Units Sold	**50**		100	$35.00
7	Revenue	$ 2,750.00		150	$28.33
8	Cost Per Unit ($15)	$ 15.00		200	$25.00
9	Variable Cost	$ 750.00		250	$23.00
10	Fixed Costs ($2000)	$ 2,000.00		300	$21.67
11	Total Costs	$ 2,750.00		350	$20.71
12	Profit	$ -		400	$20.00
13				450	$19.44
14				500	$19.00
15					

We wish to produce a list of breakeven *Prices* for the *Units* listed. For example, at 300 Units the breakeven price is $21.67.

About using a One Variable Data Table to Return Breakeven Prices

To build our table of breakeven prices, we can no longer use Goal Seek; it can only return a single answer for profit and can only vary a single cell. We cannot use Solver either. While Solver can vary multiple cells, it too can only produce a single answer.

The solution we will use is a *One-Variable Data Table*. It is designed to run multiple variables through an equation to produce a table of results. However, it does not have the algebraic capabilities that Goal Seek and Solver do – data tables will run the variables you give them through an equation to return whatever the results turn out to be, but you cannot tell it what you want those results to be. Fortunately, we can get around this limitation using some simple algebra:

a. We know that: Profit = Price * Units – Fixed Costs – Variable Costs
b. We know that we want profit to be zero.
c. All we have to do is solve the equation for *Price* (or *Units* depending on what you are solving for) and set *Profit* to zero. Because profit is zero in our equation, Price (or Units) is forced to return a number that makes profit equal zero.

See the next page on how the *Price* breakeven and *Units* breakeven formulas are derived.

Breakeven Equations for Price and Units

The breakeven point is where you there is no profit and no loss. In other words, profit equals zero. The calculations below show you how to get breakeven *Price* and breakeven *Units*.

Equation for Breakeven Price

Our profit is: Gross – Total Costs or more specifically for our example:

$$Profit = Price * Units - Variable\ Cost\ Per\ Unit * Units - Fixed\ Costs$$

We know breakeven occurs when *Profit* goes to zero so we will move *Fixed Costs* to the left and eliminate *Profit* by setting it to zero:

$$-Price * Units = -Variable\ Cost\ Per\ Unit * Units - Fixed\ Costs$$

Multiplying through by -1:

$$Price * Units = Variable\ Cost\ Per\ Unit * Units + Fixed\ Costs$$

Dividing both sides by Units:

$$Price = \frac{Variable\ Cost\ Per\ Unit * \cancel{Units}}{\cancel{Units}} + \frac{Fixed\ Costs}{Units}$$

Units cancel in the first part leaving the equation for getting the breakeven price at:

$$\boldsymbol{Price = Variable\ Cost\ Per\ Unit + \frac{Fixed\ Costs}{Units}}$$

Equation for Breakeven Price

Equation for Breakeven Units

Profit is: Gross – Total Costs or more specifically for our example:

$$Profit = Price * Units - Variable\ Cost\ Per\ Unit * Units - Fixed\ Costs$$

We know breakeven occurs when *Profit* goes to zero so we will move *Fixed Costs* to the left and eliminate *Profit* from the equation by setting it to zero:

$$Fixed\ Costs = Price * Units - Variable\ Cost\ Per\ Unit$$ * Units

Simplifying

$$Fixed\ Costs = Units\ (Price - Variable\ Cost\ Per\ Unit)$$

Solving for *Units*, the equation to get breakeven for units is:

$$\boldsymbol{Units = \frac{Fixed\ Costs}{(Price - Variable\ Cost\ Per\ Unit)}}$$

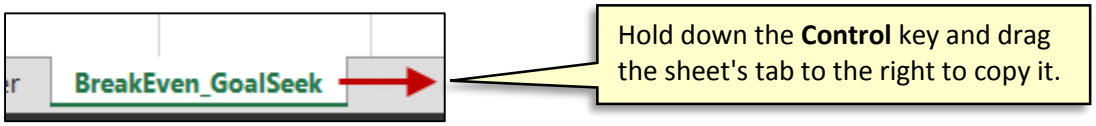
Equation for Breakeven Units

Price Breakeven Table Exercise Part 1: Building the New Model

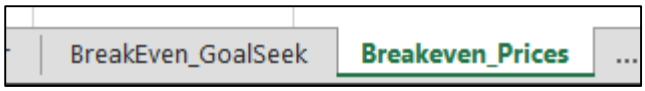
Our first step is to adjust our spreadsheet as follows:

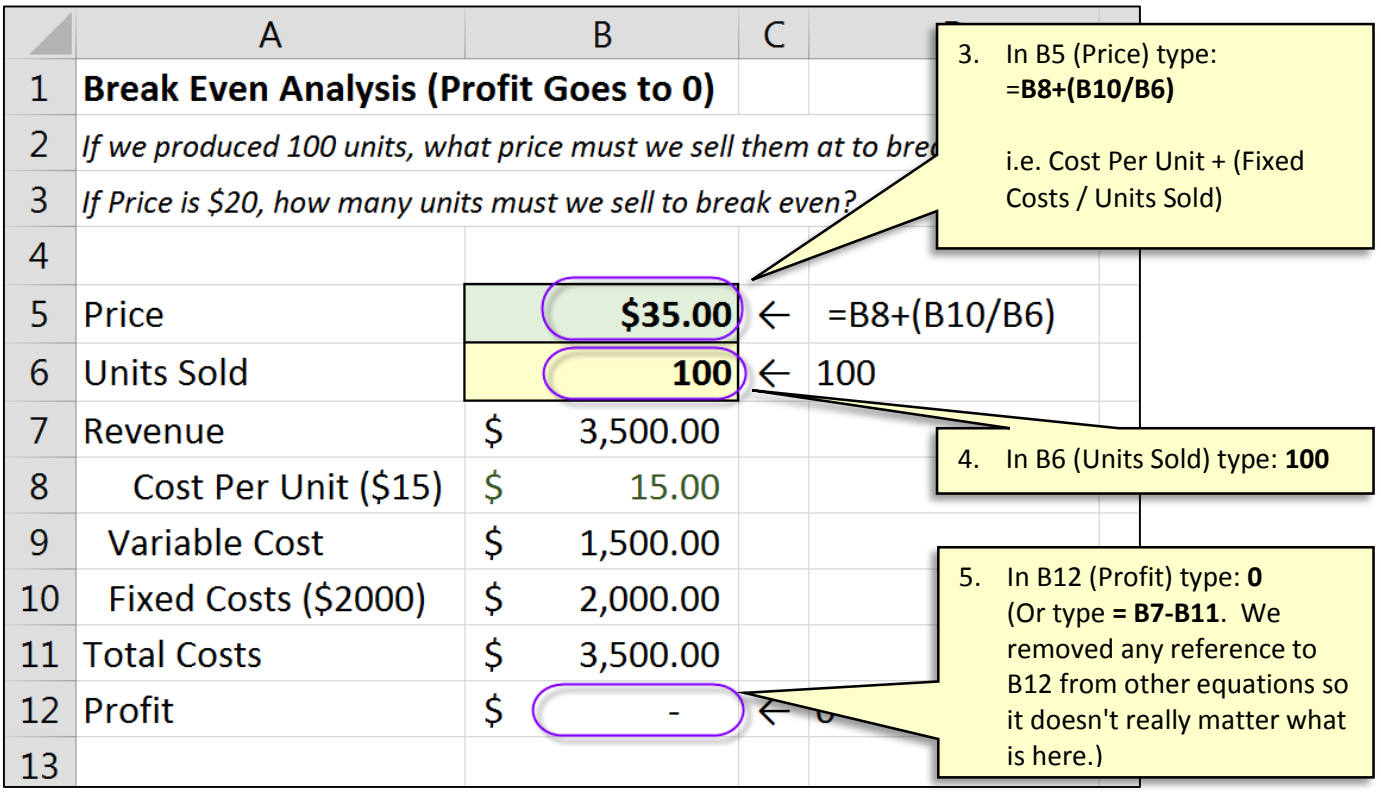
- Set **Units** to any constant we desire (50 for example).
- Set **Price** to our breakeven equation for **Price**.

1. Make a copy of the "*Breakeven_GoalSeek*" sheet:



2. Rename the new sheet to "**Breakeven_Prices** " by double clicking the tab's name, typing the new name, and pressing enter.





3. Type any positive number (greater than zero) for Units Sold (B6). Price (B5) should instantly show you the price you need to charge to breakeven for the number of units entered.

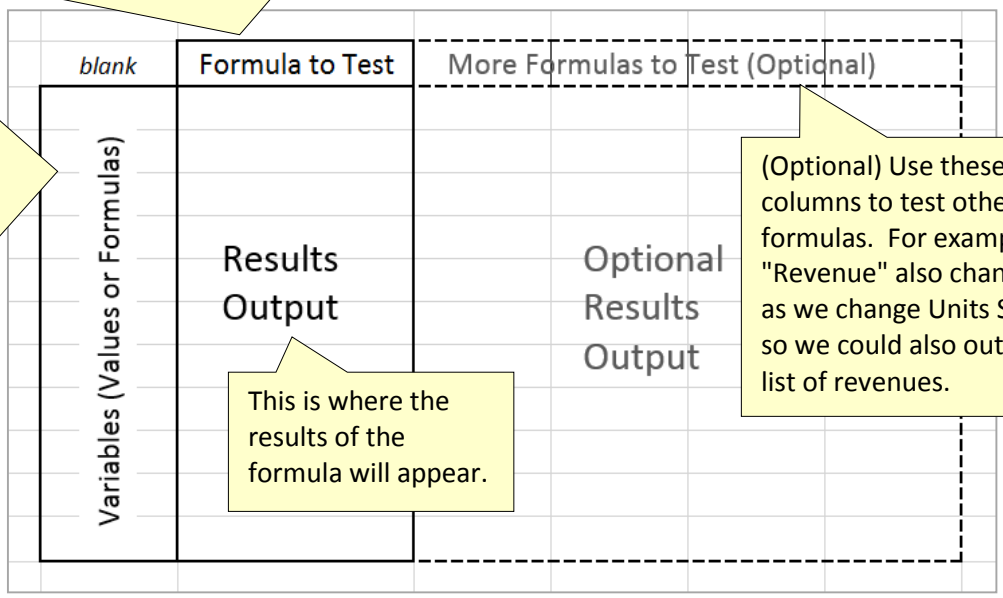
Now that we have created a model that allows us to type in different *Units* and always returns *Prices* that keeps *Profit* at zero, we can create a one variable data table. We will give it a list of different possible Units and it will return breakeven prices for those units. See the next page on how to structure a one-variable data table.

Structure of a One Variable Data Table

Excel's *One Variable* and *Two Variable Data Tables* allow you to produce a table of results by varying one or two of a calculation's inputs. For example, if we provide a list of different *Units*, a One Variable Data Tables can produce the Breakeven *Price* for each unit. Data Tables require a very specific structure to be used correctly. The structure of a one variable data table is shown below.

Formula Whose Results You wish to Generate
This cell must contain either the formula whose results you wish to display or a link to the cell containing the formula whose results you wish to display.
In this example, we wish to produce different Prices based on Units sold. Our calculation to get the Breakeven Price is =B8+(B10/B6) and is in B5. So, the area indicated (*Formula to Test*) either needs to repeat that formula or reference B5 (i.e. =B5).

Variable List
This is a list of the different values you wish to substitute into the formula.
In this example the area will contain Units. Each one of these values will be substituted into the "*Formula to Test*" one by one to produce the results.



Note that for this to work, there must be a mathematical relationship between Units and Price. For example, if manually typing different units in B6 does not change price (B5) then a One Variable Data Table can't help you. All the data table is really doing is substituting each variable one by one into B6 to produce a table of different prices for each unit substituted in.

(See the next page for *Price Breakeven Table Exercise Part 2: Using the One Variable Data Table*)

Price Breakeven Table Exercise Part 2: Using the One Variable Data Table

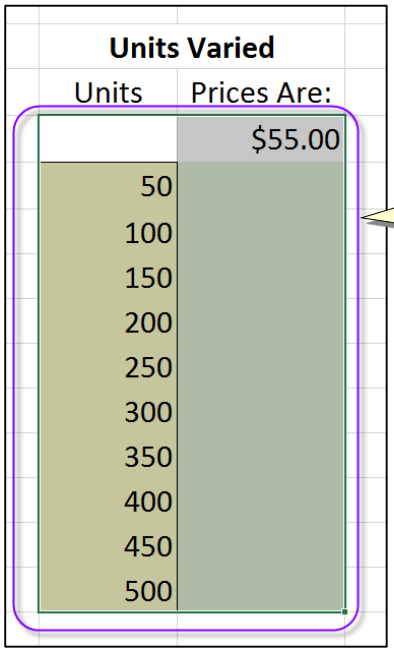
We will now create a table of breakeven *Prices* given a series of *Units*.

1. On the "**Breakeven_Prices**" tab, create the structure shown in columns D & E.

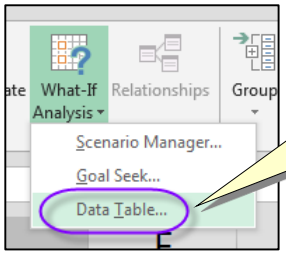
	A	B	C	D	E
1	**Break Even Analysis (Profit = 0)**				
2	*What Should Price be to break even if we vary Units?*				
3				**Units Varied**	
4		**Units Varied**		Units	Prices Are:
5	Price	$ 35.00			$35.00
6	Units Sold	**100**		50	
7	Revenue	$ 3,500.00		100	
8	Cost Per Unit ($15)	$ 15.00		150	
9	Variable Cost	$ 1,500.00		200	
10	Fixed Costs ($2000)	$ 2,000.00		250	
11	Total Costs	$ 3,500.00		300	
12	Profit			350	
13				400	
14				450	
15				500	

2. In **E5** type: **=B5** *(This is the formula used to generate our prices.)*

3. In **D6:D15**, type the units you would like to find breakeven *Prices* for. *(These are our column variables and will be substituted into B6 one at a time to produce our table of prices.)*



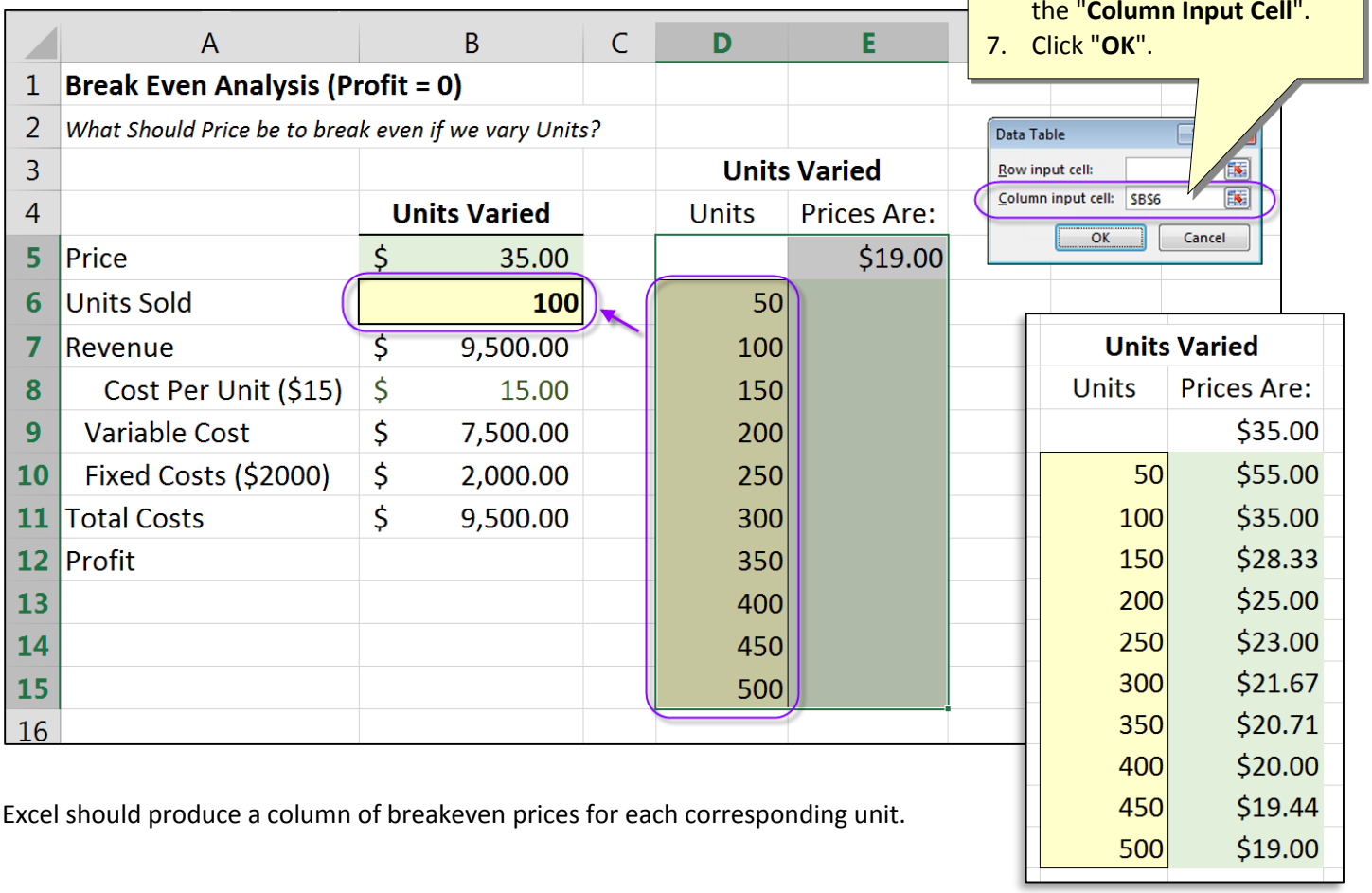
4. Highlight the range **D5:E15** as indicated.



5. From the menu, click the "**Data**" tab then "**What-If Analysis**" then "**Data Table…**".

This is a One-Variable Data Table so we only have a *Column Input Cell*. *Row Input Cell* will be left blank. The Column Input Cell is the cell that you want your column of variables (i.e. "Units") to be substituted into to generate the prices. In this case, we wish to substitute our column of UNITS (D6:D15) into cell B6.

6. Select **B6** (Units Sold) as the "**Column Input Cell**".
7. Click "**OK**".



	A	B	C	D	E
1	**Break Even Analysis (Profit = 0)**				
2	*What Should Price be to break even if we vary Units?*				
3				**Units Varied**	
4		**Units Varied**		Units	Prices Are:
5	Price	$ 35.00			$19.00
6	Units Sold	**100**		50	
7	Revenue	$ 9,500.00		100	
8	Cost Per Unit ($15)	$ 15.00		150	
9	Variable Cost	$ 7,500.00		200	
10	Fixed Costs ($2000)	$ 2,000.00		250	
11	Total Costs	$ 9,500.00		300	
12	Profit			350	
13				400	
14				450	
15				500	
16					

Units Varied	
Units	Prices Are:
	$35.00
50	$55.00
100	$35.00
150	$28.33
200	$25.00
250	$23.00
300	$21.67
350	$20.71
400	$20.00
450	$19.44
500	$19.00

Excel should produce a column of breakeven prices for each corresponding unit.

Breakeven Exercise Part 3: Display Prices and Revenues

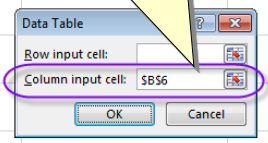
A one variable data table can display the results for more than one formula as long as both formulas are affected by the same variable. We will modify our data table to also include **Revenues**.

1. In **F5** type: **=B7**

(B7 contains the formula for Revenue. Referencing it here tells the table to generate results for Revenue for the various Units.)

	A	B	C	D	E	F
1	**Break Even Analysis (Profit = 0)**					
2	*What Should Price be to break even if we vary Units?*					
3					**Units Varied**	
4		**Units Varied**		Units	Prices Are:	
5	Price	$ 35.00			$35.00	$ 3,500.00
6	Units Sold	**100**		50	$55.00	
7	Revenue	$ 3,500.00		100	$35.00	
8	Cost Per Unit ($15)	$ 15.00		150	$28.33	
9	Variable Cost	$ 1,500.00		200	$25.00	
10	Fixed Costs ($2000)	$ 2,000.00		250	$23.00	

2. Highlight **D3:F15**.
3. From the menu, click the "**Data**" tab then "**What-If Analysis**" – "**Data Table…**".
4. Set the "**Column Input Cell**" to **B6**.
5. Click "**OK**".



	A	B	C	D	E	F
1	**Break Even Analysis (Profit = 0)**					
2	*What Should Price be to break even if we vary Units?*					
3					**Units Varied**	
4		**Units Varied**		Units	Prices Are:	
5	Price	$ 35.00			$35.00	$ 3,500.00
6	Units Sold	**100**		50	$55.00	
7	Revenue	$ 3,500.00		100	$35.00	
8	Cost Per Unit ($15)	$ 15.00		150	$28.33	
9	Variable Cost	$ 1,500.00		200	$25.00	
10		2,000.00		250	$23.00	
11		3,500.00		300	$21.67	
12				350	$20.71	
13				400	$20.00	
14				450	$19.44	
15				500	$19.00	

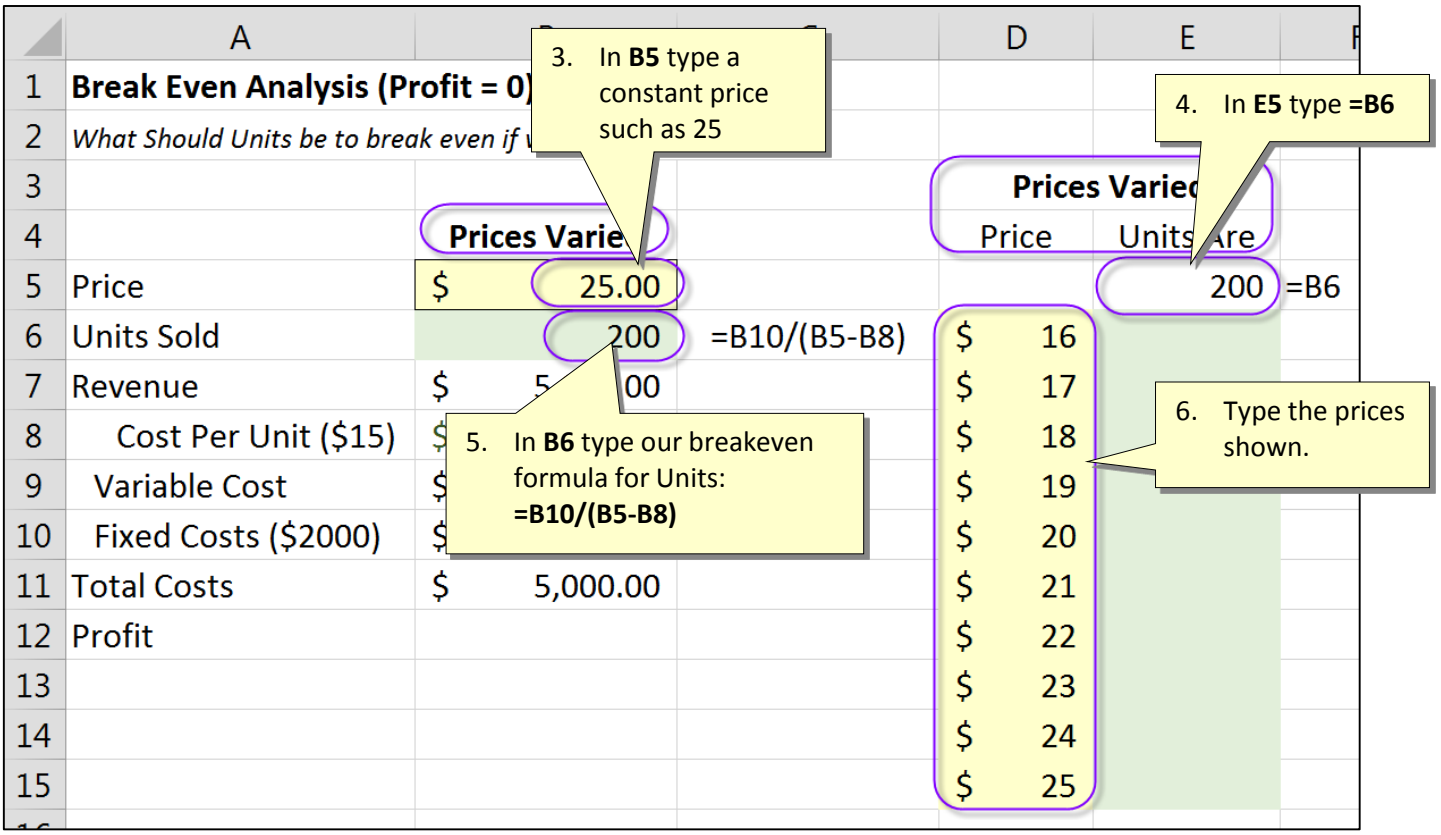
Units	Prices Are:	
	$35.00	$3,500
50	$55.00	$2,750
100	$35.00	$3,500
150	$28.33	$4,250
200	$25.00	$5,000
250	$23.00	$5,750
300	$21.67	$6,500
350	$20.71	$7,250
400	$20.00	$8,000
450	$19.44	$8,750
500	$19.00	$9,500

Excel should have also produced a column of revenues that correspond to the number of units being sold.

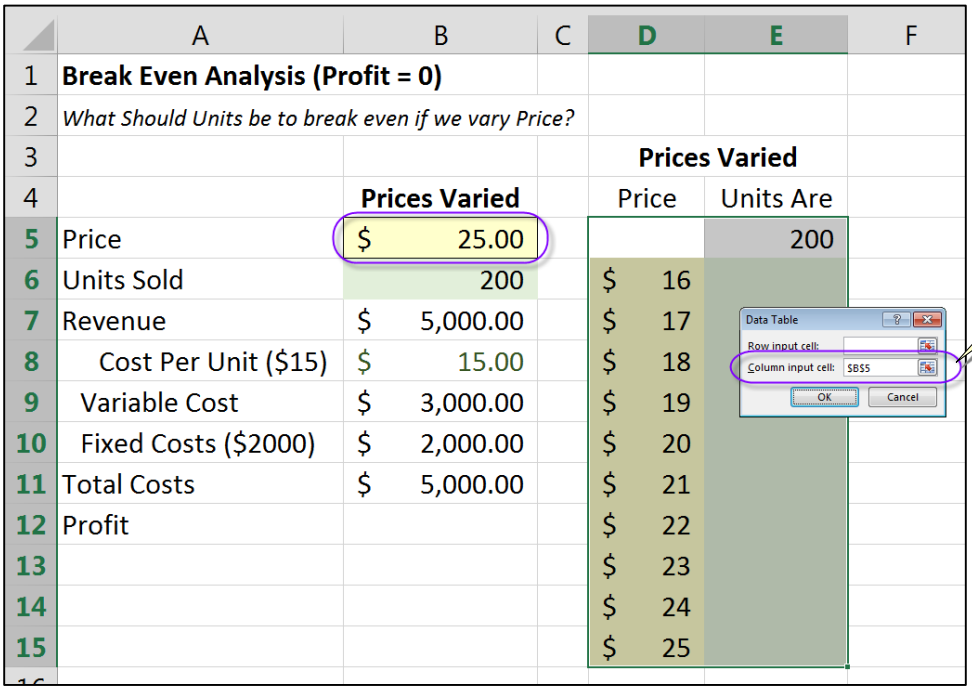
Optional Exercise: Find Breakeven Units when Prices Vary

In our previous data table exercise, we varied units to produce a series of breakeven prices. You can also vary prices to see what your breakeven units will be.

1. Copy the previous exercise to a new sheet and name the new sheet "**Breakeven_Units**".
2. Make the edits shown below.



7. Highlight **D5:E15**
8. From the menu click the "**Data**" tab and then click "**What-If Analysis**" – "**Data Table**".



9. Set the **Column Input Cell** to B5.
10. Click "**OK**".

Excel should produce a table of breakeven units for the various prices given.

Price	Units Are
	200
$ 16	2,000
$ 17	1,000
$ 18	667
$ 19	500
$ 20	400
$ 21	333
$ 22	286
$ 23	250
$ 24	222
$ 25	200

Exercise: Adjust Costs as Units change with VLookup()

	A	B
1	**Break Even Analysis (Profit = 0)**	
2	*What Should Price be to break even if we vary Units?*	
3		
4		**Units Varied**
5	Price	$ 35.00
6	Units Sold	**100**
7	Revenue	$ 3,500.00
8	Cost Per Unit ($15)	$ 15.00
9	Variable Cost	$ 1,500.00
10	Fixed Costs ($2000)	$ 2,000.00
11	Total Costs	$ 3,500.00
12	Profit	

In our previous examples, varied **Units Sold** to see what our breakeven prices would be. In our equations, *Cost Per Unit* was held constant at $15 and *Fixed Cost* was held constant at $2000 regardless of the number of units sold. In reality however, both of these numbers would probably change as volume changes.

Cost Per Unit
As units increase, this cost will probably go down as you realize economies of scale. For example, your suppliers of raw materials might give you price breaks when you purchase in greater volume.

Fixed Costs
Fixed costs include things that don't change as production changes. For example, mortgage payments, lease payments, salaries, etc. However, for the purpose of our model, once units hits a certain point, will have to purchase or lease more buildings and hire more employees so for our model, *Fixed Costs* will go up as **Units** increase.

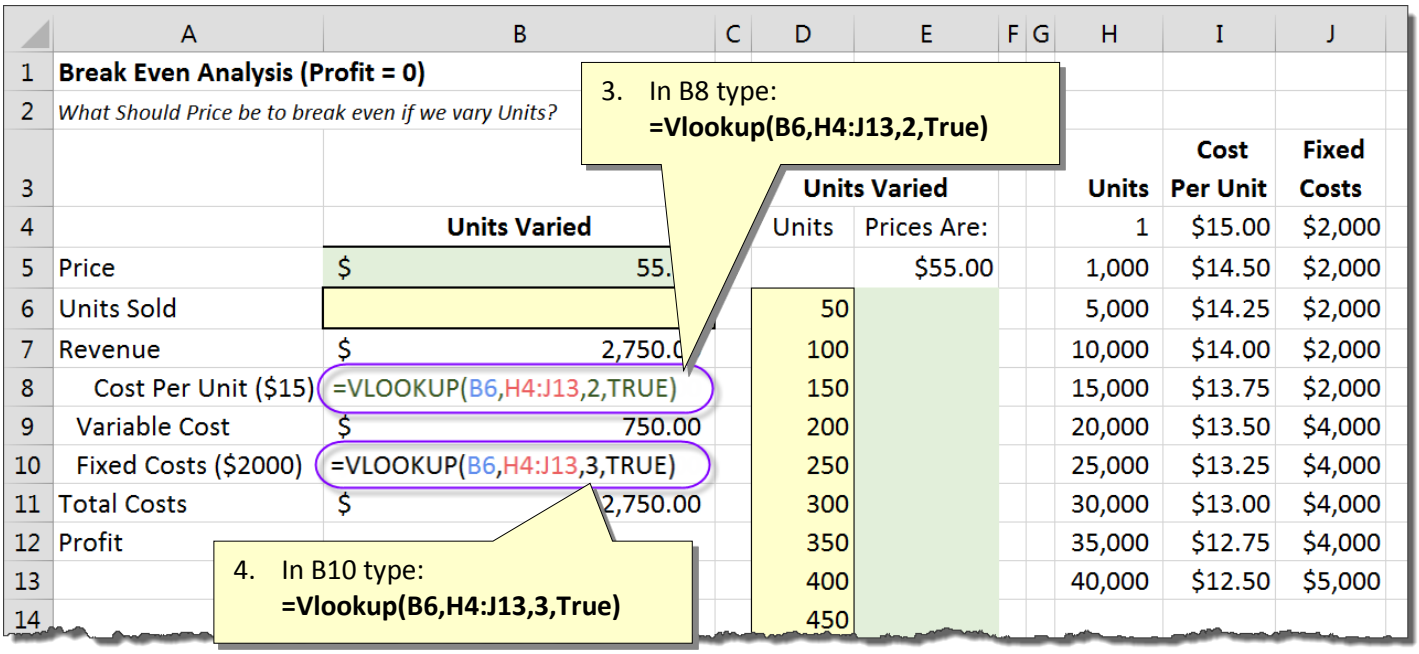
1. Go to the "**Breakeven_Prices**" sheet.
2. Type the data shown in **H3:J13**

	A	B	C	D	E	F	G	H	I	J
1	**Break Even Analysis (Profit = 0)**									
2	*What Should Price be to break even if we vary Units?*									
3				**Units Varied**				**Units**	**Cost Per Unit**	**Fixed Costs**
4		**Units Varied**		Units	Prices Are:			1	$15.00	$2,000
5	Price	$ 55.00			$55.00			1,000	$14.50	$2,000
6	Units Sold	**50**		50				5,000	$14.25	$2,000
7	Revenue	$ 2,750.00		100				10,000	$14.00	$2,000
8	Cost Per Unit ($15)	$ 15.00		150				15,000	$13.75	$2,000
9	Variable Cost	$ 750.00		200				20,000	$13.50	$4,000
10	Fixed Costs ($2000)	$ 2,000.00		250				25,000	$13.25	$4,000
11	Total Costs	$ 2,750.00		300				30,000	$13.00	$4,000
12	Profit			350				35,000	$12.75	$4,000
13				400				40,000	$12.50	$5,000
14				450						
15				500						

This is the table we will use to lookup the *Cost Per Unit* and *Fixed Costs* associated with the number of *Units* sold. (We are assuming we sell everything we make.)
Vlookup() will look for the units we give it in the "Units" column. When selecting the bracket, Vlookup() grabs the largest value it finds in the Units column that is less than or equal to what we are looking for. For example:

- If we are looking for 9,000 units, 5,000 is the largest number in the Units column that is less than or equal to 9,000 so it will use the costs in row 6 (14.25 and 2000).
- If we are looking for 50 units, 1 is the largest number in the Units column that is less than or equal to 50 so it will use the costs in row 4 (15 and 2000).

When using Vlookup(), you must construct your table with how vlookup() searches in mind.

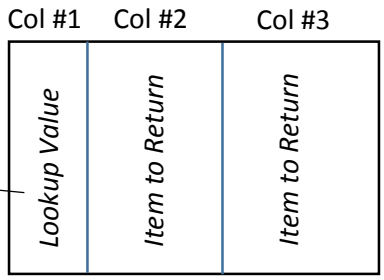


	A	B	C	D	E	F	G	H	I	J
1	**Break Even Analysis (Profit = 0)**									
2	*What Should Price be to break even if we vary Units?*									
3					**Units Varied**			**Units**	**Cost Per Unit**	**Fixed Costs**
4		**Units Varied**		Units	Prices Are:			1	$15.00	$2,000
5	Price	$ 55.			$55.00			1,000	$14.50	$2,000
6	Units Sold			50				5,000	$14.25	$2,000
7	Revenue	$ 2,750.0		100				10,000	$14.00	$2,000
8	Cost Per Unit ($15)	=VLOOKUP(B6,H4:J13,2,TRUE)		150				15,000	$13.75	$2,000
9	Variable Cost	$ 750.00		200				20,000	$13.50	$4,000
10	Fixed Costs ($2000)	=VLOOKUP(B6,H4:J13,3,TRUE)		250				25,000	$13.25	$4,000
11	Total Costs	$ 2,750.00		300				30,000	$13.00	$4,000
12	Profit			350				35,000	$12.75	$4,000
13				400				40,000	$12.50	$5,000
14				450						

5. Try typing different Units in B6 to test your Vlookup()s. Cost Per Unit and Fixed Costs should update accordingly.
6. Regenerate your One Variable Data Table to output the new breakeven prices.

How Vlookup() Works

Vlookup() allows you to return data that is associated with a lookup value. In this example we searched our table for *Units Sold* (Lookup Value) and returned the *Cost Per Unit* and *Fixed Costs* associated with the units we were looking for.



The Lookup value must be to the left of the item you are returning and for approximate matches they must be sorted.

The syntax of Vlookup() is as follows.

=Vlookup(Lookup Value, Table to Search, Item to Return by Column #, Match Type)

This is the value you wish to search by. In this example, we searched by *Units Sold*. Your lookup value must be to the left of what you are returning.

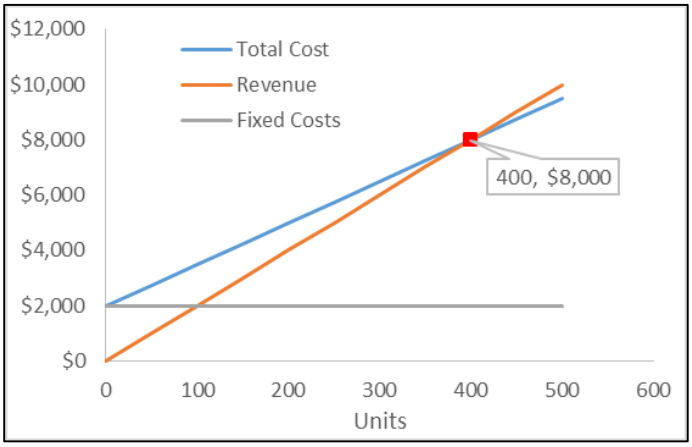
This is the range of the table you are searching. It must include the column of your lookup values and the values you are returning. In this example it is H4:J13

This is the column number (counting within the table from left to right) containing the value associated with the item you are looking for. In this example, to return *Cost Per Unit* we put a 2; to return *Fixed Costs* we put a 3.

Match Type is either *True* or *False* and specifies whether you want an exact match (False) or an approximate match (True). Use an exact match (False) when searching by ID numbers or names. Use approximate match (True) when working with number ranges. Approximate match finds the largest number that is less than or equal to what you are looking for.

Creating a Break Even Chart (Excel 2013)

Graphically, breakeven occurs when ***Total Costs*** intersects ***Revenue***. In the image to the right, we are holding *Price* constant at $20 and plotting *Fixed Costs*, *Total Costs*, and *Revenue*. As indicated by the graph, breakeven occurs at 400 *Units*. At this point, both *Total Cost* and *Revenue* are $8,000.



We will create the chart as follows:

A. Use a One-Variable Data Table to generate *Total Costs* and *Revenues* when holding price constant at $20 and varying Units.
B. Create an XY Scatter Chart to display the lines.
C. Create a 4th series that consists of a single data point (Breakeven).

Part A: Create the Data for the Graph

1. Create the spreadsheet shown below (or copy the "*Breakeven_GoalSeek*" sheet we created earlier). It simply calculates what *Profit*, *Revenue*, *Variable Costs* and *Total Costs* would be if you vary *Price* or *Units*.

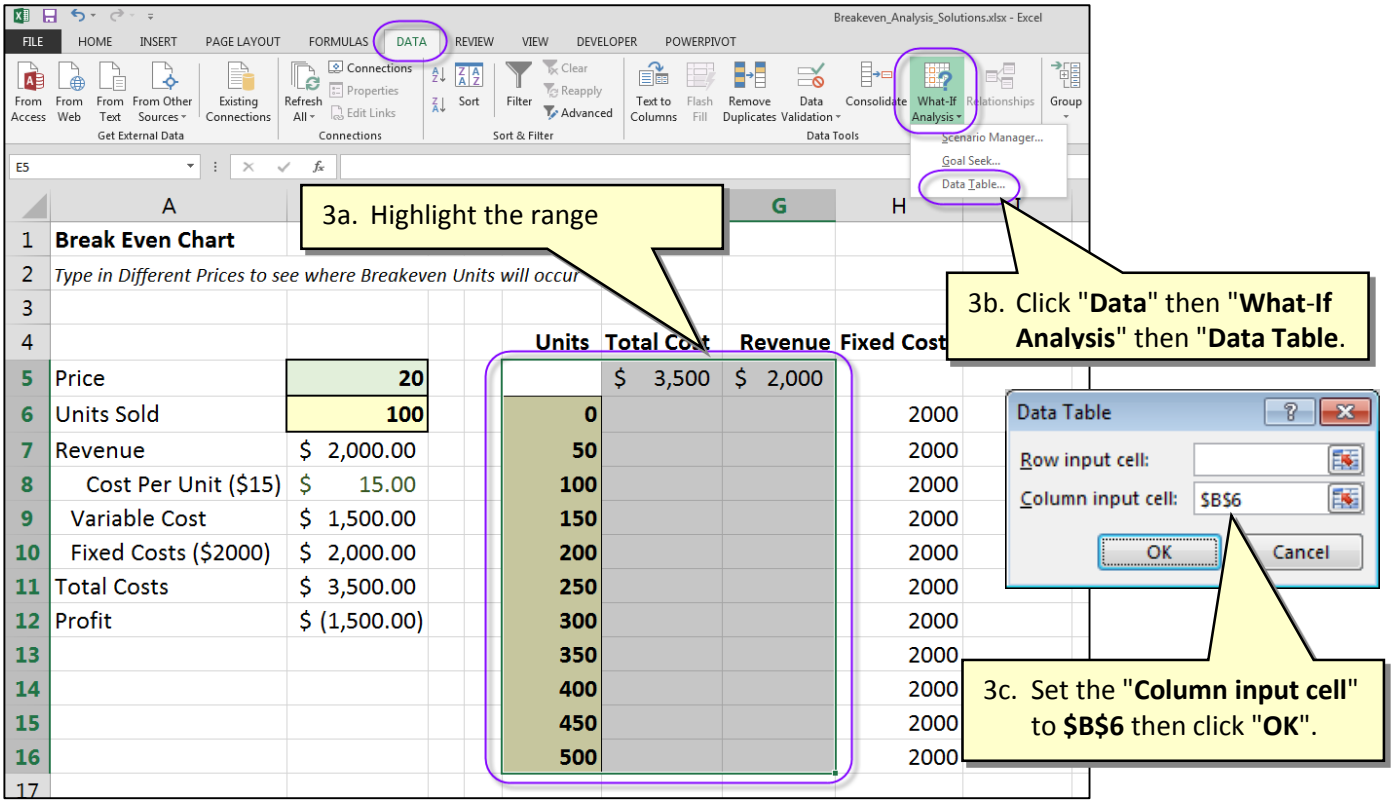
	A	B	C	D
1	**Break Even Chart**			
2	*Type in Different Prices to see where Breakeven Units will occur*			
3				
4				
5	Price	**20**		
6	Units Sold	**100**		
7	Revenue	$ 2,000.00	←	=B5*B6
8	Cost Per Unit ($15)	$ 15.00		
9	Variable Cost	$ 1,500.00	←	=B8*B6
10	Fixed Costs ($2000)	$ 2,000.00		
11	Total Costs	$ 3,500.00	←	=B9+B10
12	Profit	$ (1,500.00)	←	=B7-B11
13				

Type formulas where indicated; other values are constants.

2. Create what is shown in columns E through H. This is to generate values for our one variable data table. (All values are static except for the two formulas indicated in F5 and G5.)

	A	B	C	D	E	F	G	H
1	**Break Even Chart**							
2	*Type in Different Prices to see where Breakeven Units will occur*							
3								
4					**Units**	**Total Cost**	**Revenue**	**Fixed Costs**
5	Price	**20**				$ 3,500	$ 2,000	
6	Units Sold	**100**			**0**	=B11	=B7	2000
7	Revenue	$ 2,000.00			**50**			2000
8	Cost Per Unit ($15)	$ 15.00			**100**			2000
9	Variable Cost	$ 1,500.00			**150**			2000
10	Fixed Costs ($2000)	$ 2,000.00			**200**			2000
11	Total Costs	$ 3,500.00			**250**	These are static numbers.		2000
12	Profit	$ (1,500.00)			**300**			2000
13					**350**			2000
14					**400**			2000
15					**450**		These are static numbers.	2000
16					**500**			2000
17								

3. To generate the One-Variable Data Table, follow the steps below:



	A	B	C	D	E	F	G	H
1	**Break Even Chart**							
2	*Type in Different Prices to see where Breakeven Units will occur*							
3								
4					**Units**	**Total Cost**	**Revenue**	**Fixed Costs**
5	Price	**20**				$ 3,500	$ 2,000	
6	Units Sold	**100**			**0**	2000	0	2000
7	Revenue	$ 2,000.00			**50**	2750	1000	2000
8	Cost Per Unit ($15)	$ 15.00			**100**	3500	2000	
9	Variable Cost	$ 1,500.00			**150**	4250	3000	
10	Fixed Costs ($2000)	$ 2,000.00			**200**	5000	4000	
11	Total Costs	$ 3,500.00			**250**	5750	5000	
12	Profit	$ (1,500.00)			**300**	6500	6000	
13					**350**	7250	7000	2000
14					**400**	8000	8000	2000
15					**450**	8750	9000	2000
16					**500**	9500	10000	2000

These values should have been generated. Note that they will update if you change Price (B5).

Part B: Create an XY Scatter Chart to Display the Lines

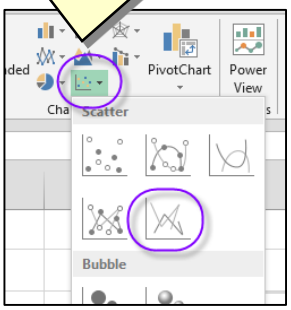
When highlighting to create an XY Scatter Chart as we are doing below, Excel will assume that the left most column is for all X data points for all lines. The multiple columns to the right will each be a separate line and contain the Y data points.

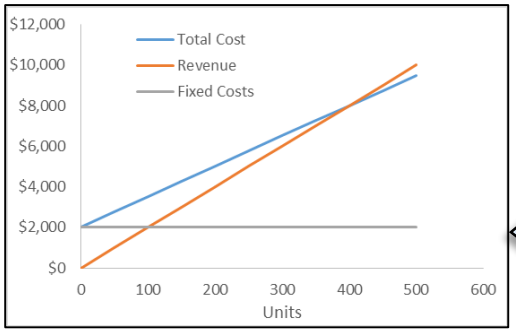
	D	E	F	G	H
3					
4		**Units**	**Total Cost**	**Revenue**	**Fixed Costs**
5			$ 3,500	$ 2,000	
6		**0**	2000	0	2000
7		**50**	2750	1000	2000
8		**100**	3500	2000	2000
9		**150**	4250	3000	2000
10		**200**	5000	4000	2000
11		**250**	5750	5000	2000
12		**300**	6500	6000	2000
13		**350**	7250	7000	2000
14		**400**	8000	8000	2000
15		**450**	8750	9000	2000
16		**500**	9500	10000	2000

1. Highlight **E4:H4**
   (These will become our legend).

2. Hold down the **Control** key on your keyboard and highlight **E6:H6**
   (These will become our data points).

3. From the menu click "**Insert**" then "**XY Scatter**" then "**Scatter with Straight Lines**".





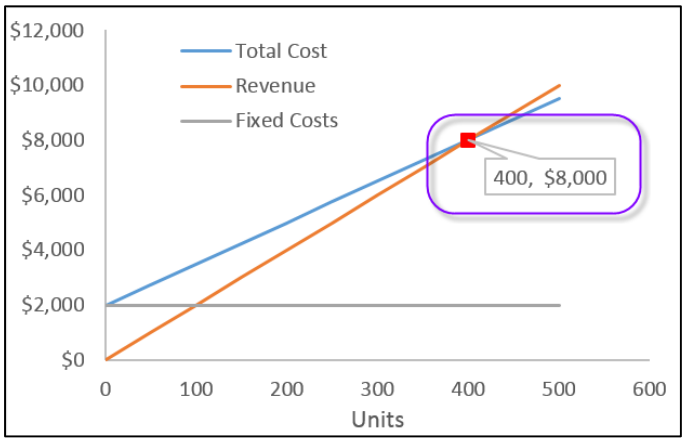
You should now have a XY Scatter chart similar to the one shown here. Note that if you change Price (B5), the date table and the chart will update.

Part C: Marking the Breakeven Point

We wish to mark the breakeven point on our chart. We could use Excel's drawing tools to annotate it but that would not update should we change the price we are charging. Instead, we will add a 4th series that contains just one data point. To make the data point dynamic, we will base its X value on the breakeven calculation for Units:

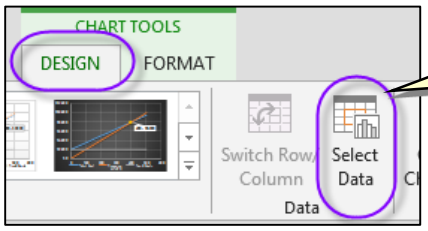
BE Units = Fixed Costs / (Price –Variable Cost)

To get the corresponding Y value:
BE Units * Price



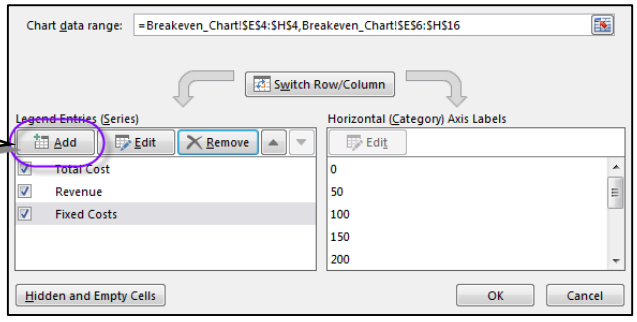
	A	B	C	D
4				
5	Price	20		
6	Units Sold	100		
7	Revenue	$ 2,000.00		
8	Cost Per Unit ($15)	$ 15.00		
9	Variable Cost	$ 1,500.00		
10	Fixed Costs ($2000)	$ 2,000.00		
11	Total Costs	$ 3,500.00		
12	Profit	$ (1,500.00)		
13				
14	BE Units (X):	400		
15	Corrisponding Y:	$ 8,000.00		
16				

1. In B14 type: **=B10/(B5-B8)**
2. In B15 type: **=B5*B14**

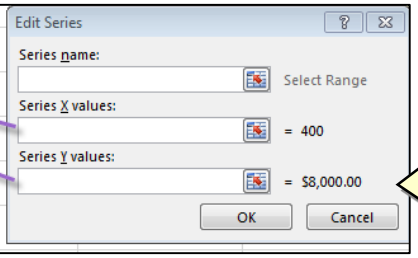


3. Click your chart to make the chart tools appear on the menu.
4. Click the "**Design**" tab then the "**Select Data**" button.

5. Click the "**Add**" button to add a 4th series to the chart.



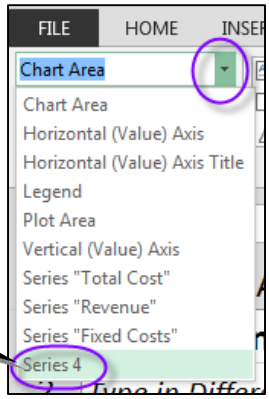
12	Profit	$ (1,500.00)	
13			
14	BE Units (X):	400	
15	Corrisponding Y:	$ 8,000.00	
16			
17			

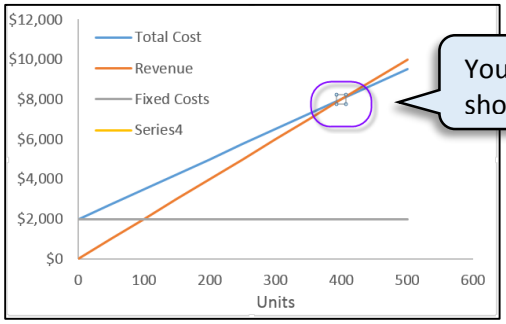


6. Set the "**Series X Values**" to cell **B14**.
7. Set the "**Series Y Values**" to cell **B15**.
8. Click "**OK**".
9. Click "**OK**" again.

You may have noticed that the data point is not visible on your chart. We must now give it some color.

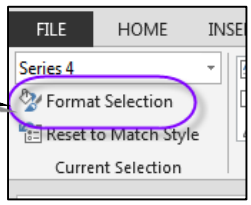
10. Click the chart to activate the *Chart Tools*.
11. Click the "**Format**" tab under *Chart Tools*.
12. Click the "**Chart Elements**" drop down (located in the upper left).
13. Select "**Series 4**" from the list of chart elements.



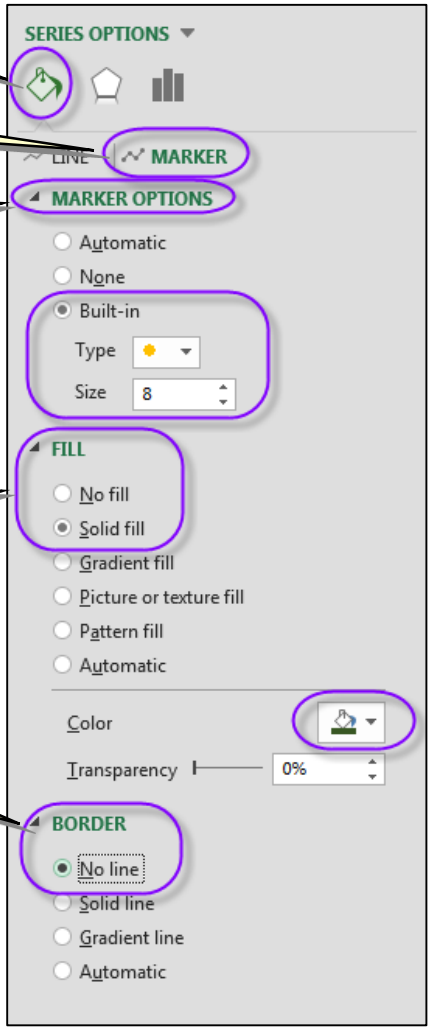


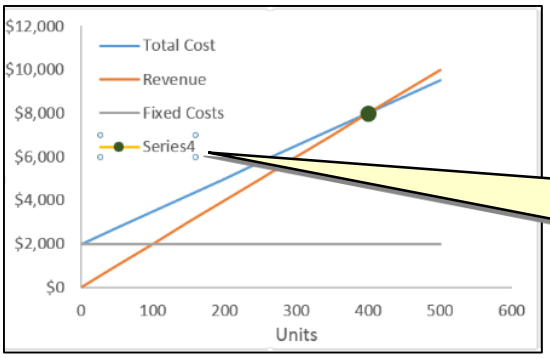
Your Series 4 data point should now be selected.

14. Click "**Format Selection**".



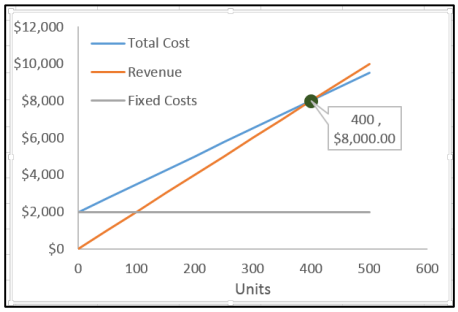
15. Click "**Line & Fill**".
16. Click "**Marker**".
17. Expand "**Marker Options**".
    a. Select "**Built-in**"
    b. Specify a "**Type**" and "**Size**".
18. Expand "**Fill**".
    a. Select "**Solid Fill**"
    b. Specify a "**Color**"
19. Expand "**Border**".
    a. Select "**No Line**".

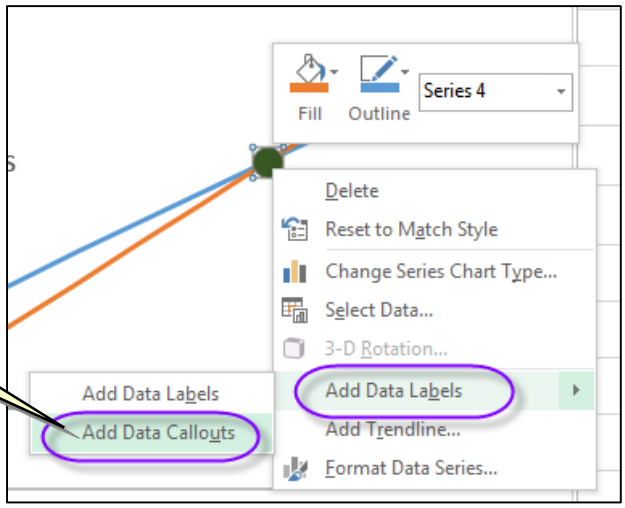




20. Select "**Series4**" in the legend and press your delete key.

21. To label the Breakeven point:
    a. Right click the data point.
    b. Click "**Add Data Labels**".
    c. Click "**Add Data Callouts**".





21. Change the "**Price**" in cell **B5** and the chart should adjust accordingly. (Note that changing Units Sold has no effect on our chart. It was designed to only be affected by changes in *Price*.)

	A	B
1	**Break Even Chart**	
2	*Type in Different Prices to see where Breakeven Unit*	
3		
4		
5	Price	**25**
6	Units Sold	**100**
7	Revenue	$ 2,500.00
8	Cost Per Unit ($15)	$ 15.00
9	Variable Cost	$ 1,500.00
10	Fixed Costs ($2000)	$ 2,000.00
11	Total Costs	$ 3,500.00
12	Profit	$ (1,000.00)
13		
14	BE Units (X):	200
15	Corresponding Y:	$ 5,000.00