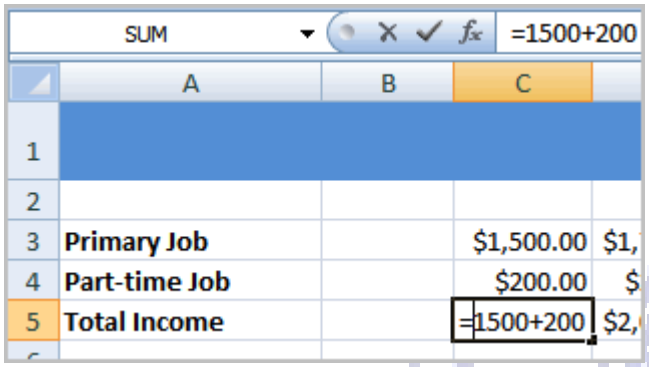
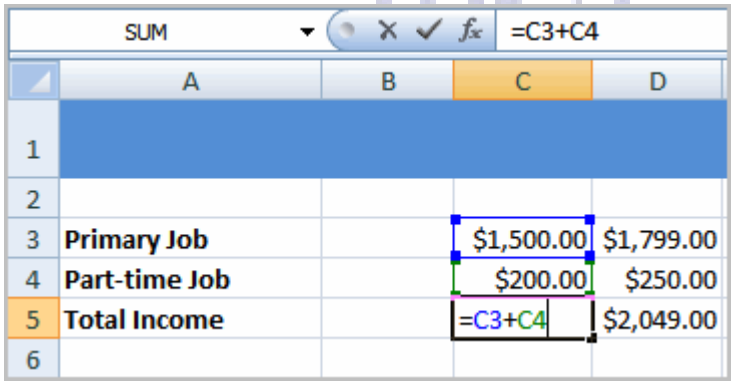
Lec 2 - To Create a Simple Formula that Adds Two Numbers:

- Click the cell where the formula will be defined (C5, for example).
- Type the equal sign (=) to let Excel know a formula is being defined.
- Type the first number to be added (e.g., 1500)
- Type the **addition sign (+)** to let Excel know that an add operation is to be performed.
- Type the second number to be added (e.g., 200)
- Press **Enter** or click the **Enter button** on the Formula bar to complete the formula.



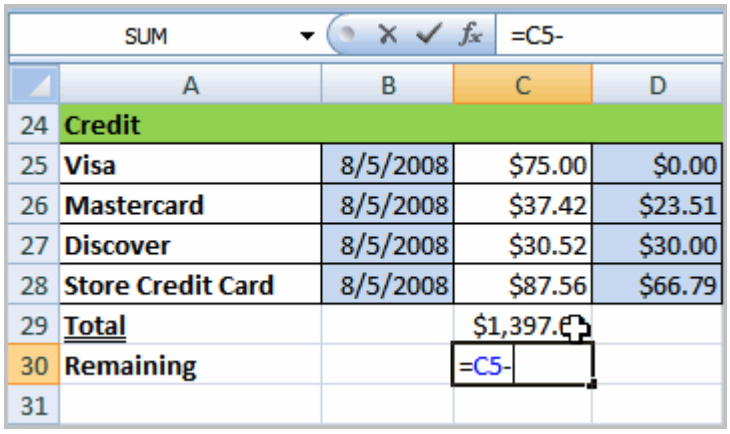
To Create a Simple Formula that Adds the Contents of Two Cells:

- Click the cell where the answer will appear (C5, for example).
- Type the equal sign (=) to let Excel know a formula is being defined.
- Type the cell number that contains the first number to be added (C3, for example).
- Type the **addition sign (+)** to let Excel know that an add operation is to be performed.
- Type the cell address that contains the second number to be added (C4, for example).
- Press **Enter** or click the **Enter button** on the Formula bar to complete the formula.

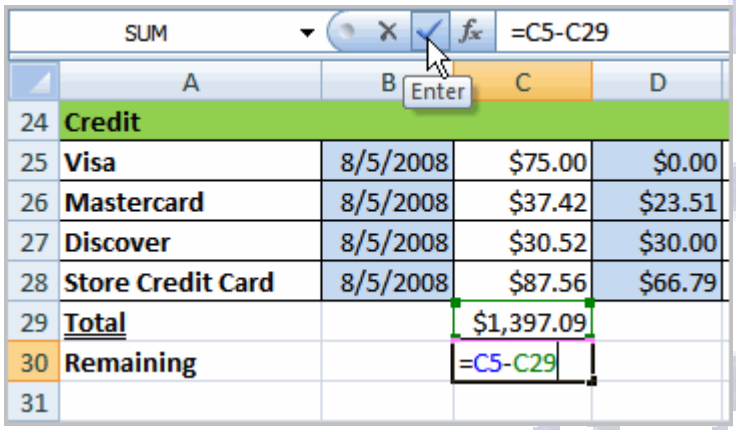


To Create a Simple Formula using the Point and Click Method:

- Click the cell where the answer will appear (C30, for example).
- Type the equal sign (=) to let Excel know a formula is being defined.
- Click on the **first cell** to be included in the formula (C5, for example).
- Type the **subtraction sign (-)** to let Excel know that a subtraction operation is to be performed.
- Click on the **next cell** in the formula (C29, for example).

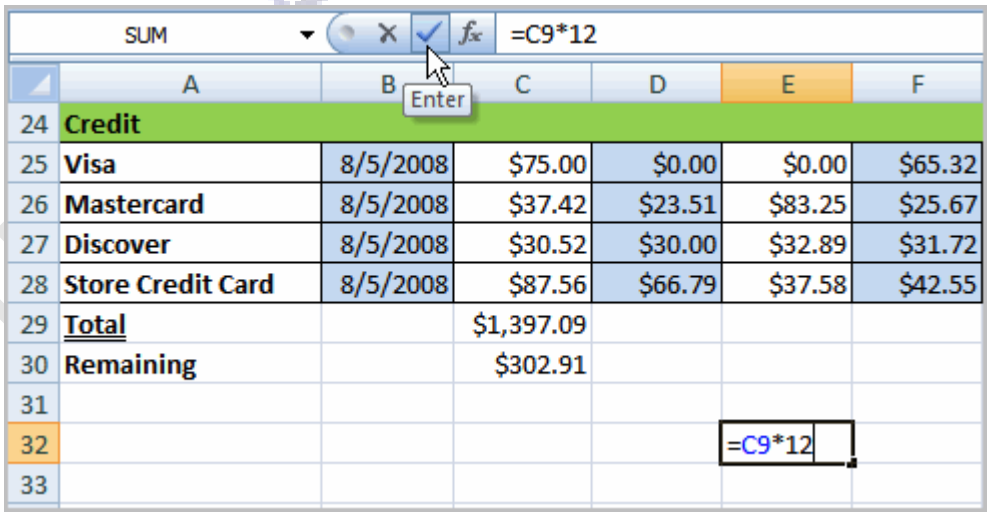


- Press **Enter** or click the **Enter button** on the Formula bar to complete the formula.



To Create a Simple Formula that Multiplies the Contents of Two Cells:

- Select the cell where the answer will appear (E32, for example).
- Type the equal sign (=) to let Excel know a formula is being defined.
- Click on the **first cell** to be included in the formula (C9, for example) or type a number.
- Type the multiplication symbol (*) by pressing the Shift key and then the number 8 key. The operator displays in the cell and Formula bar.
- Click on the **next cell** in the formula or type a number (12, for example).
- Press **Enter** or click the **Enter button** on the Formula bar to complete the formula.

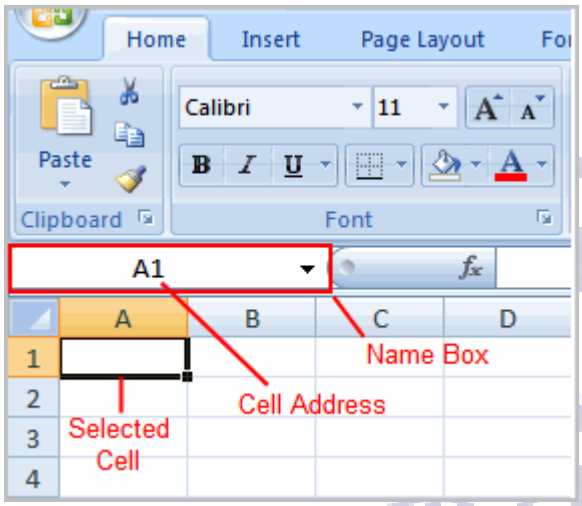


To Create a Simple Formula that Divides One Cell by Another:

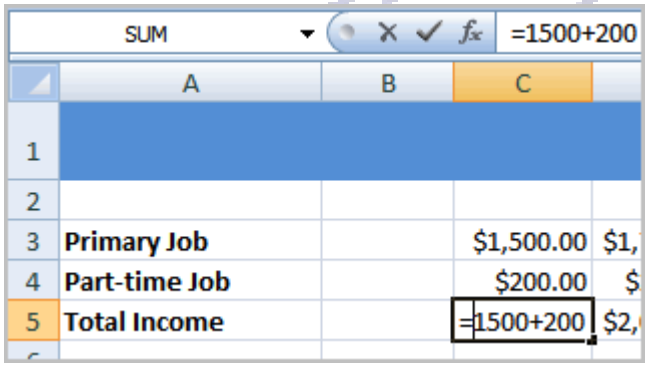
- Click the cell where the answer will appear.
- Type the equal sign (=) to let Excel know a formula is being defined.
- Click on the **first cell** to be included in the formula.
- Type a division symbol. The operator displays in the cell and Formula bar.
- Click on the **next cell** in the formula.
- **Enter** or click the **Enter button** on the Formula bar to complete the formula.

Using Cell References

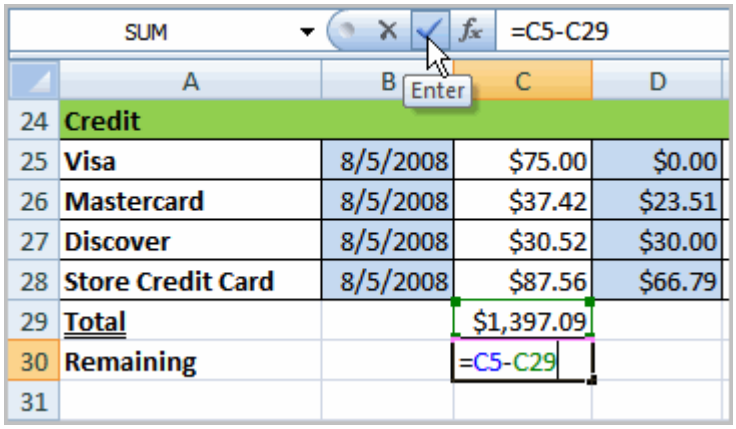
As you can see, there are many ways to create a simple formula in Excel. Most likely you will choose one of the methods that enters the cell address into the formula, rather than an actual number. The cell address is basically the name of the cell and can be found in the Name Box.



The following example uses actual numbers in the formula in C5.



When a cell address is used as part of a formula, this is called a **cell reference**. It is called a **cell reference** because instead of entering specific numbers into a formula, the cell address refers to a specific cell. The following example uses cell references in the formula in C30.



Complex Formulas Defined

Simple formulas have **one** mathematical operation. **Complex formulas** involve **more than one** mathematical operation.

Simple Formula: =2+2
Complex Formula: =2+2*8

To calculate complex formulas correctly, you must perform certain operations before others. This is defined in the **order of operations**.

The Order of Operations

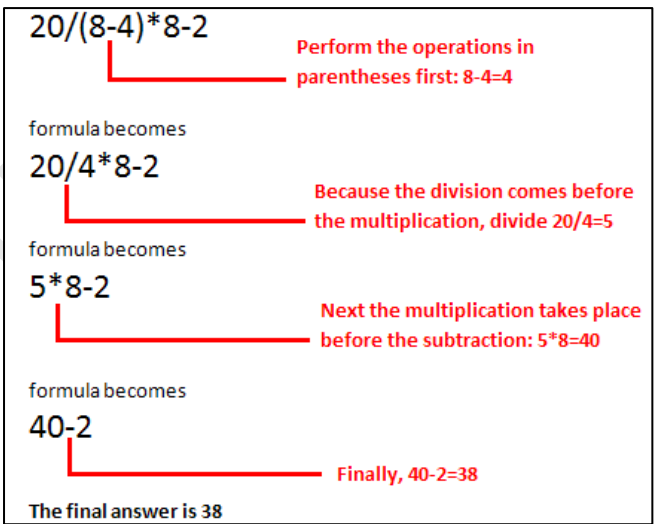
The order of mathematical operations is very important. If you enter a formula that contains several operations, Excel knows to work those operations in a specific order. The **order of operations** is:

1. Operations enclosed in parenthesis
2. Exponential calculations (to the power of)
3. Multiplication and division, whichever comes first
4. Addition and subtraction, whichever comes first

A mnemonic that can help you remember this is **P**lease **E**xcuse **M**y **D**ear **A**unt **S**ally (P.E.M.D.A.S).

Example 1

Using this order, let us see how the formula **20/(8-4)*8-2** is calculated in the following breakdown:



Example 2

3+3*2=?

Is the answer 12 or 9? Well, if you calculated in the order in which the numbers appear, 3+3*2, you'd get the wrong answer, 12. You must follow the order of operations to get the correct answer.

To Calculate the Correct Answer:

1. Calculate 3*2 first because **multiplication** comes **before addition** in the order of operations. The answer is 6.
2. Add the answer obtained in step #1, which is 6, to the number 3 that opened the equation. In other words, add 3 + 6.
3. The answer is 9.

Complex Formulas (continued)

Before moving on, let's explore some more formulas to make sure you understand the order of operations by which Excel calculates the answer.

4*2/4	**Multiply** 4*2 **before** performing the **division** operation because the multiplication sign comes before the division sign. The answer is 2.
4/2*4	**Divide** 4 by 2 **before** performing the **multiplication** operation because the division sign comes before the multiplication sign. The answer is 8.
4/(2*4)	Perform the operation in **parentheses** (2*4) first and **divide** 4 by this result. The answer is 0.5.
4-2*4	**Multiply** 2*4 before performing the **subtraction** operation because the multiplication sign is of a higher order than the subtraction sign. The answer is -4.

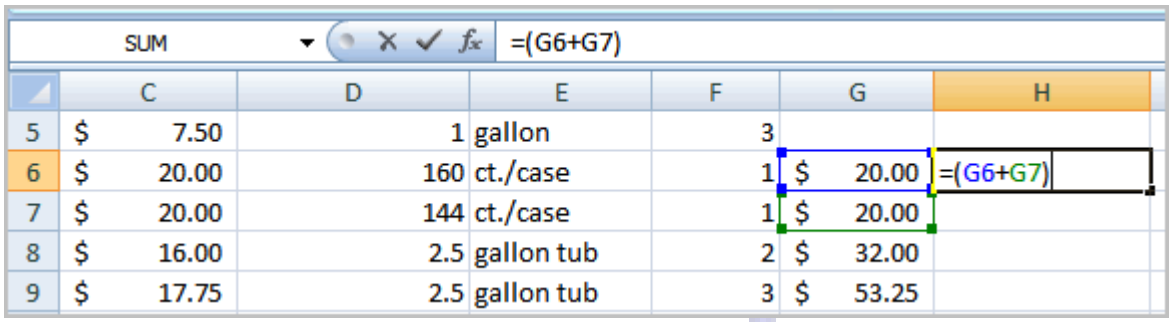
Creating Complex Formulas

Excel **automatically** follows a **standard order of operations** in a complex formula. If you want a certain portion of the formula to be calculated first, put it in parentheses.

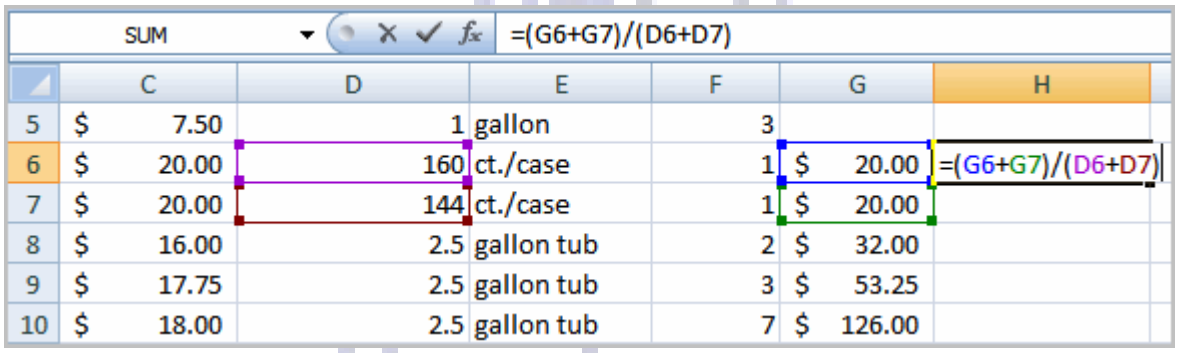
Example of How to Write a Complex Formula:

- Click the cell where you want the formula **result** to appear. In this example, H6.
- Type the equal sign (=) to let Excel know a formula is being defined.
- Type an open parenthesis, or (

- Click on the **first cell** to be included in the formula (G6, for example).
- Type the **addition sign (+)** to let Excel know that an add operation is to be performed.
- Click on the **second cell** in the formula (G7, for example)
- Type a close parentheses).



- Type the next mathematical operator, or the **division symbol (/)** to let Excel know that a division operation is to be performed.
- Type an open parenthesis, or (
- Click on the **third cell** to be included in the formula (D6, for example).
- Type the **addition sign (+)** to let Excel know that an add operation is to be performed.
- Click on the **fourth cell** to be included in formula. (D7, for example).
- Type a close parentheses).

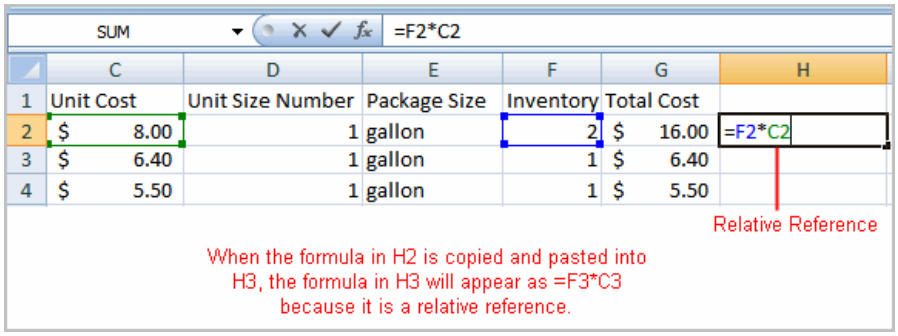


- **Very Important:** Press **Enter** or click the **Enter button** on the Formula bar. This step ends the formula.

To show fewer decimal places, you can just click the **Decrease Decimal** place command on the Home tab.

What is an Absolute Reference?

In earlier lessons we saw how **cell references** in formulas **automatically adjust** to new locations when the formula is pasted into different cells. This is called a **relative reference**.



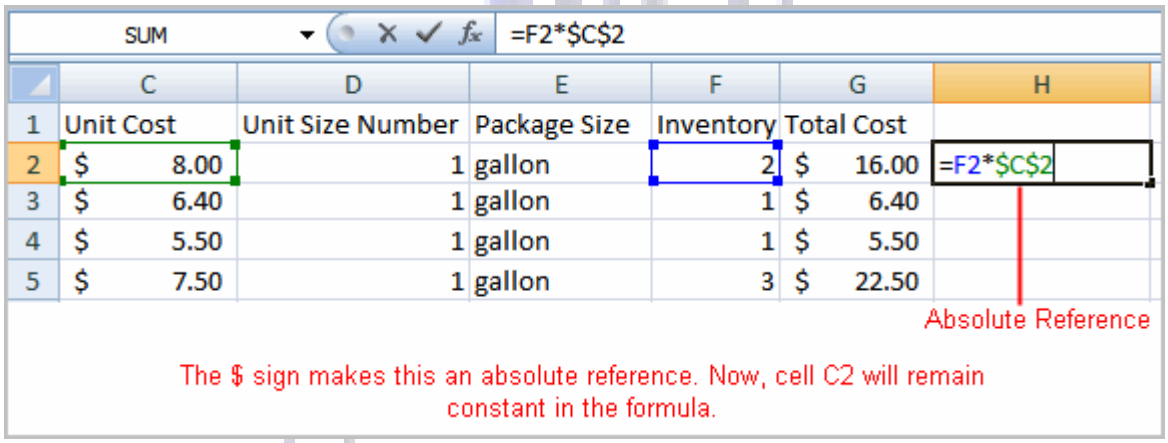
Sometimes, when you copy and paste a formula, you don't want one or more cell references to change. **Absolute reference** solves this problem. **Absolute cell references** in a formula **always** refer to the **same cell** or cell range in a formula. If a formula is copied to a different location, the absolute reference remains the same.

An absolute reference is designated in the formula by the addition of a **dollar sign ($)**. It can precede the column reference or the row reference, or both. Examples of absolute referencing include:

A2:	The column and the row do not change when copied.
A$2:	The row does not change when copied.
$A2:	The column does not change when copied.

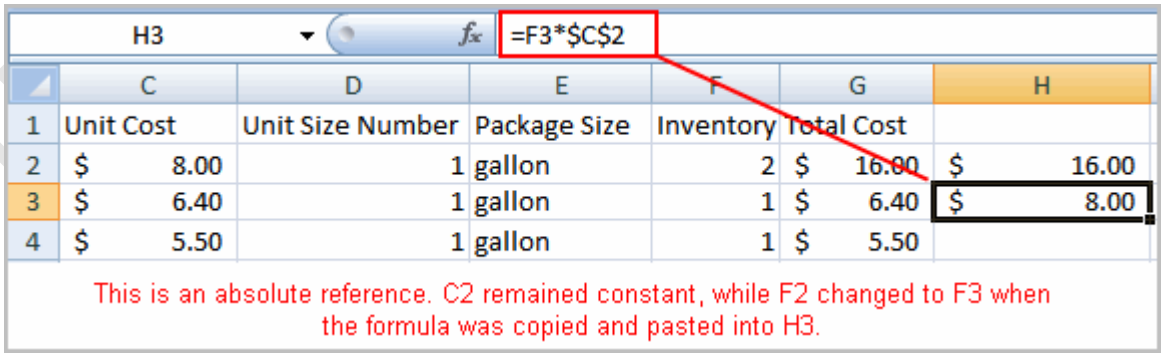
To Create an Absolute Reference:

- Select the cell where you wish to write the formula (in this example, H2)
- Type the equal sign (=) to let Excel know a formula is being defined.
- Click on the **first cell** to be included in the formula (F2, for example).
- Enter a mathematical operator (use the multiplication symbol for this example).
- Click on the **second cell** in the formula (C2, for example).
- Add a $ sign before the C and a $ sign before the 2 to create an absolute reference.



	C	D	E	F	G	H
1	Unit Cost	Unit Size Number	Package Size	Inventory	Total Cost	
2	$ 8.00	1	gallon	2	$ 16.00	=F2*C2
3	$ 6.40	1	gallon	1	$ 6.40	
4	$ 5.50	1	gallon	1	$ 5.50	
5	$ 7.50	1	gallon	3	$ 22.50	

- Copy the formula into H3. The new formula should read =F3*C2. The F2 reference changed to F3 since it is a relative reference, but C2 remained constant since you created an absolute reference by inserting the dollar signs.



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