Excel 2019 (Part 14): Relative and Absolute Cell References

There are two types of cell references: relative and absolute. Relative and absolute references behave differently when copied and filled into other cells.

In Excel , there are two types of cell references: relative and absolute. Relative and absolute references behave differently when copied and filled into other cells. Relative references change when a formula is copied to another cell. Absolute references, on the other hand, remain unchanged regardless of where they are copied.

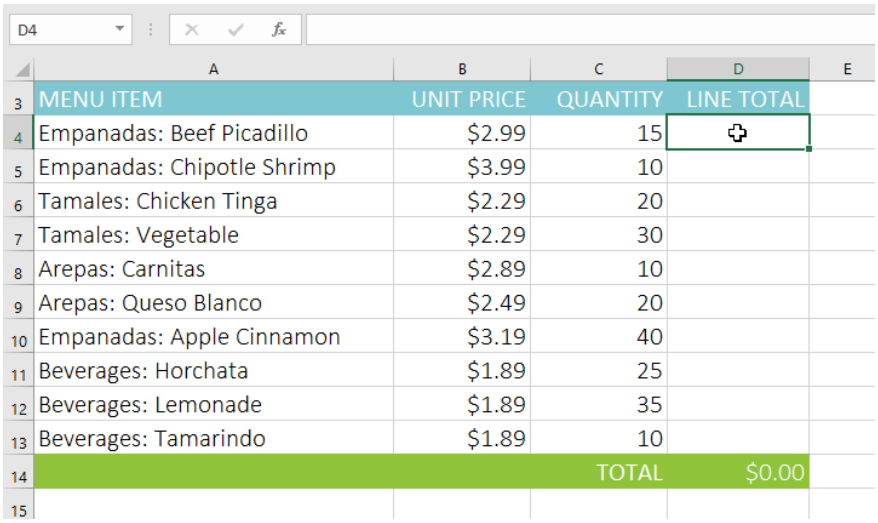
Relative references

By default, all cell references are relative references. When copied across multiple cells, they change based on the relative positions of the rows and columns. For example, if you copy the formula **=A1+B1** from row 1 to row 2, the formula will become **=A2+B2.** Relative references are especially convenient whenever you need to repeat the same calculation across multiple rows or columns.

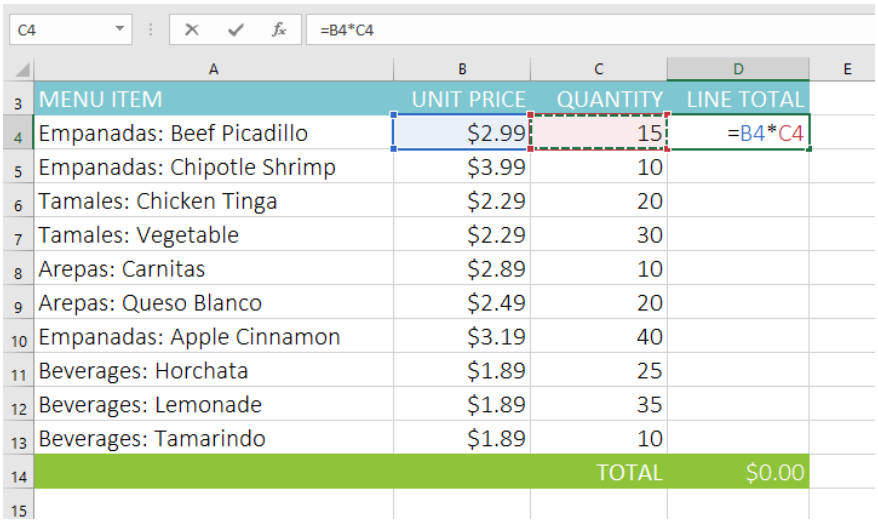
How to create and copy formulas using relative references

The following example aims to create a formula that multiplies the price of each item by the quantity. Instead of creating a new formula for each row, you can create a single formula in cell **D4** and then copy it to the other rows. The example will use relative references to ensure the formula calculates the exact total for each item.

1. Select the cell that will contain the formula. For example, we would select cell **D4.**

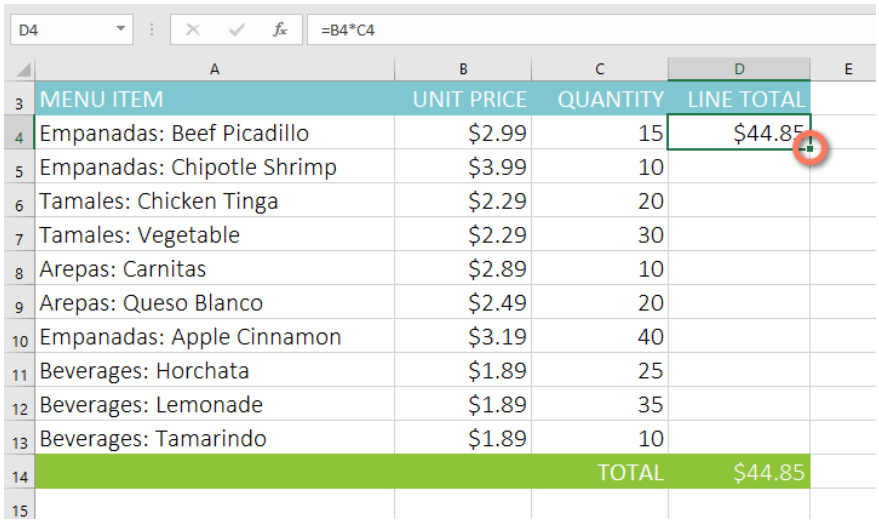


2. Enter the formula to calculate the desired value. For example, you would enter **=B4*C4.**

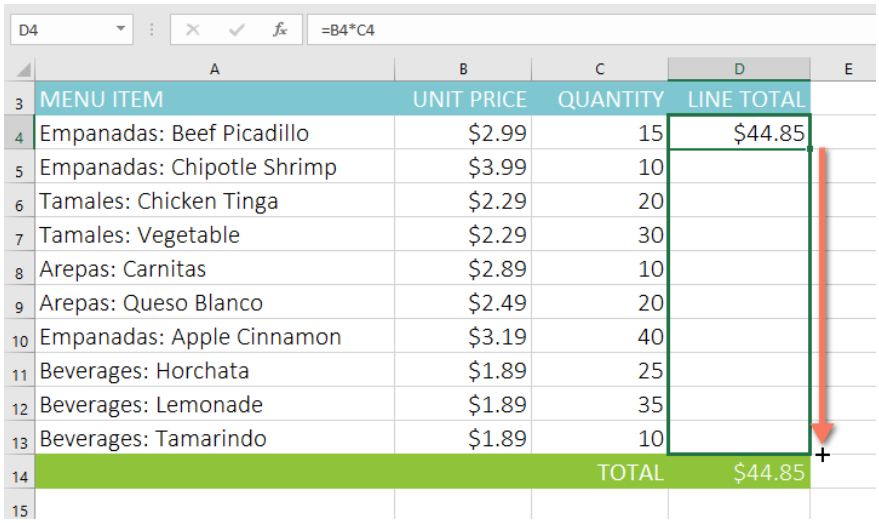


3. Press **Enter** on the keyboard. The formula will be calculated and the result will be displayed in the cell.

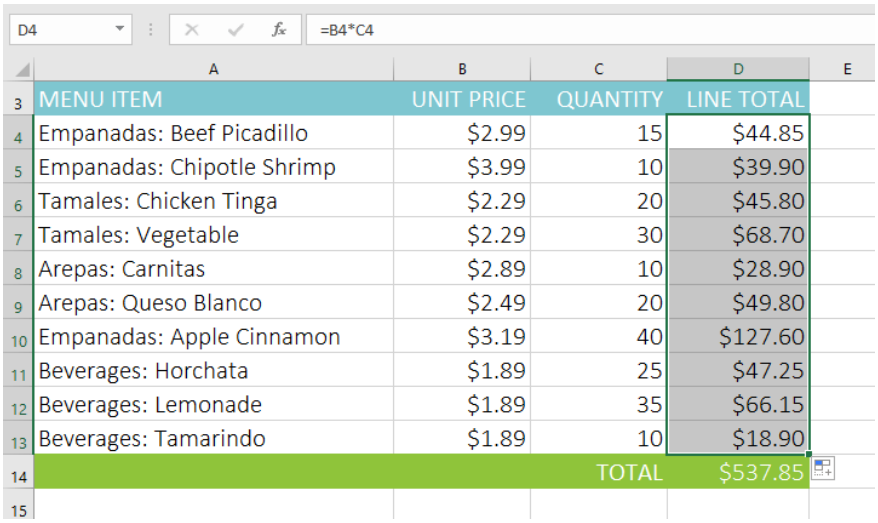
4. Locate the fill handle in the bottom right corner of the desired cell. The example will locate the fill handle for cell **D4.**



5. Click and drag the fill handle to the cells you want to fill. For example, we would select cells **D5:D13.**

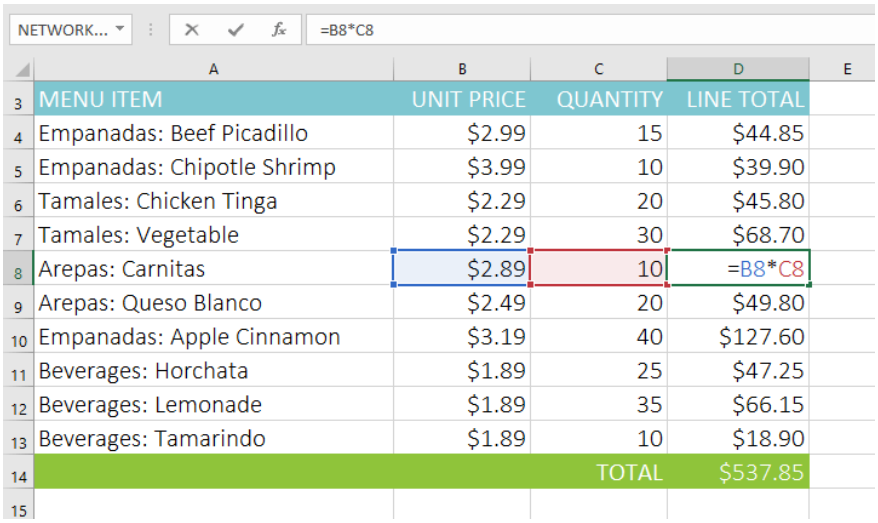


6. Release the mouse button. The formula will be copied to the selected cells with relative references, displaying the result in each cell.



	A	B	C	D	E
3	MENU ITEM	UNIT PRICE	QUANTITY	LINE TOTAL	
4	Empanadas: Beef Picadillo	$2.99	15	$44.85	
5	Empanadas: Chipotle Shrimp	$3.99	10	$39.90	
6	Tamales: Chicken Tinga	$2.29	20	$45.80	
7	Tamales: Vegetable	$2.29	30	$68.70	
8	Arepas: Carnitas	$2.89	10	$28.90	
9	Arepas: Queso Blanco	$2.49	20	$49.80	
10	Empanadas: Apple Cinnamon	$3.19	40	$127.60	
11	Beverages: Horchata	$1.89	25	$47.25	
12	Beverages: Lemonade	$1.89	35	$66.15	
13	Beverages: Tamarindo	$1.89	10	$18.90	
14			TOTAL	$537.85	
15					

You can double-click on filled cells to check the accuracy of their formulas. Relative cell references should be different for each cell, depending on its row.



	A	B	C	D	E
3	MENU ITEM	UNIT PRICE	QUANTITY	LINE TOTAL	
4	Empanadas: Beef Picadillo	$2.99	15	$44.85	
5	Empanadas: Chipotle Shrimp	$3.99	10	$39.90	
6	Tamales: Chicken Tinga	$2.29	20	$45.80	
7	Tamales: Vegetable	$2.29	30	$68.70	
8	Arepas: Carnitas	$2.89	10	=B8*C8	
9	Arepas: Queso Blanco	$2.49	20	$49.80	
10	Empanadas: Apple Cinnamon	$3.19	40	$127.60	
11	Beverages: Horchata	$1.89	25	$47.25	
12	Beverages: Lemonade	$1.89	35	$66.15	
13	Beverages: Tamarindo	$1.89	10	$18.90	
14			TOTAL	$537.85	
15					

Absolute reference

There may be times when you don't want a cell reference to change when copied to other cells. Unlike relative references, absolute references don't change when copied or filled. You can use an absolute reference to keep a row and/or column unchanged.

An absolute reference is specified in a formula by adding the dollar sign (**$**). This sign can precede a column reference, a row reference, or both.

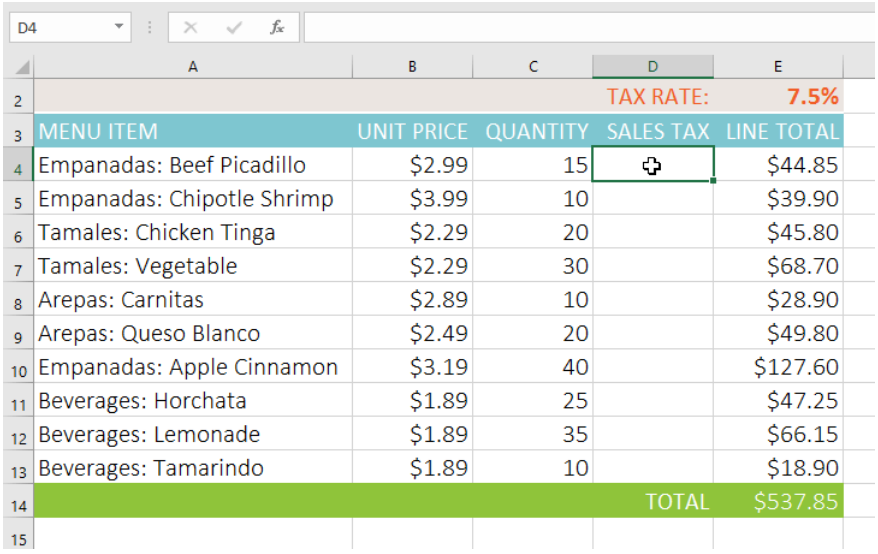
Generally, you would use the **A2** format when creating formulas that contain absolute references. The other two formats are used much less frequently.

When writing formulas, you can press the **F4** key on your keyboard to switch between relative and absolute cell references, as shown in the video below. This is an easy way to quickly insert an absolute reference.

How to create and copy formulas using absolute references

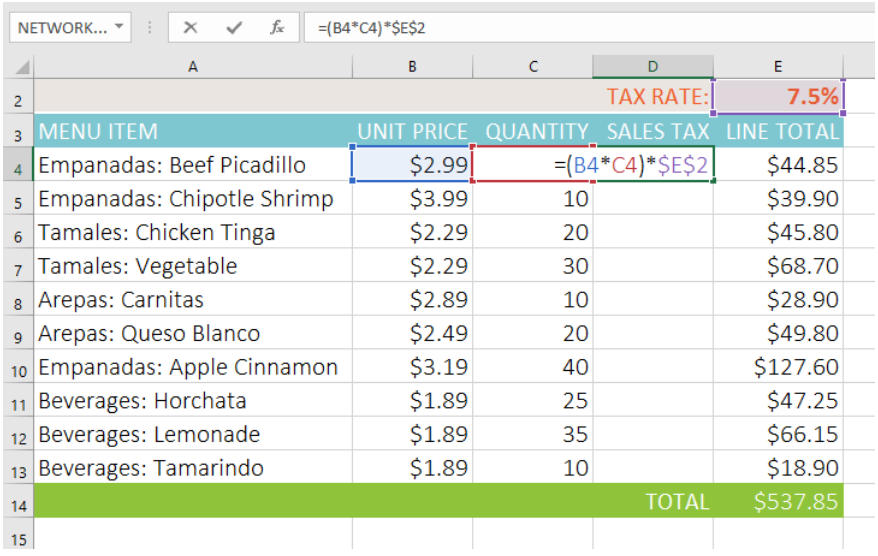
The example below will use cell **E2** (containing a 7.5% tax rate) to calculate the sales tax for each item in column **D.** To ensure the reference to the tax rate remains constant—even if the formula is copied and filled into other cells—cell **E2** needs to be set as an absolute reference.

1. Select the cell that will contain the formula. For example, we would select cell **D4.**



	A	B	C	D	E
2				TAX RATE:	7.5%
3	MENU ITEM	UNIT PRICE	QUANTITY	SALES TAX	LINE TOTAL
4	Empanadas: Beef Picadillo	$2.99	15		$44.85
5	Empanadas: Chipotle Shrimp	$3.99	10		$39.90
6	Tamales: Chicken Tinga	$2.29	20		$45.80
7	Tamales: Vegetable	$2.29	30		$68.70
8	Arepas: Carnitas	$2.89	10		$28.90
9	Arepas: Queso Blanco	$2.49	20		$49.80
10	Empanadas: Apple Cinnamon	$3.19	40		$127.60
11	Beverages: Horchata	$1.89	25		$47.25
12	Beverages: Lemonade	$1.89	35		$66.15
13	Beverages: Tamarindo	$1.89	10		$18.90
14				TOTAL	$537.85
15					

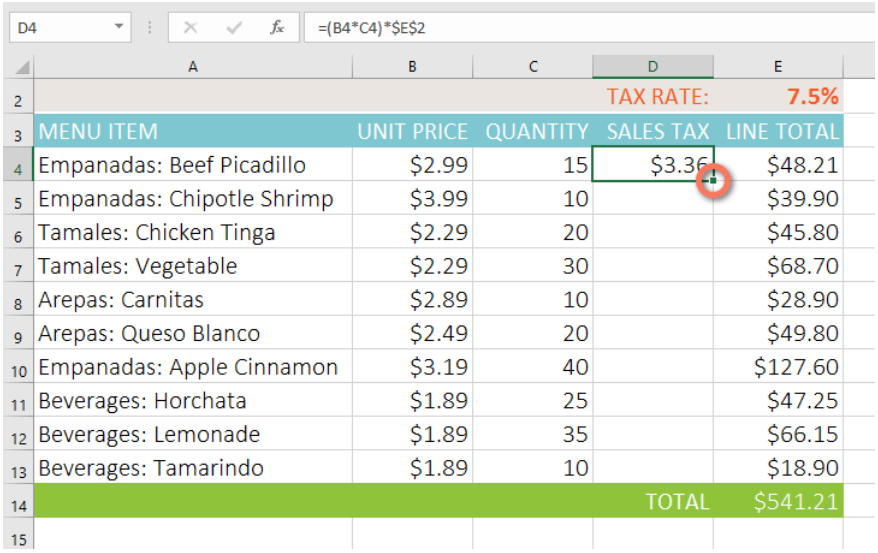
2. Enter the formula to calculate the desired value. For example, you would enter **=(B4*C4)*E2** , making **E2** an absolute reference.



	A	B	C	D	E
2				TAX RATE:	7.5%
3	MENU ITEM	UNIT PRICE	QUANTITY	SALES TAX	LINE TOTAL
4	Empanadas: Beef Picadillo	$2.99	=(B4*C4)*E2		$44.85
5	Empanadas: Chipotle Shrimp	$3.99	10		$39.90
6	Tamales: Chicken Tinga	$2.29	20		$45.80
7	Tamales: Vegetable	$2.29	30		$68.70
8	Arepas: Carnitas	$2.89	10		$28.90
9	Arepas: Queso Blanco	$2.49	20		$49.80
10	Empanadas: Apple Cinnamon	$3.19	40		$127.60
11	Beverages: Horchata	$1.89	25		$47.25
12	Beverages: Lemonade	$1.89	35		$66.15
13	Beverages: Tamarindo	$1.89	10		$18.90
14				TOTAL	$537.85
15					

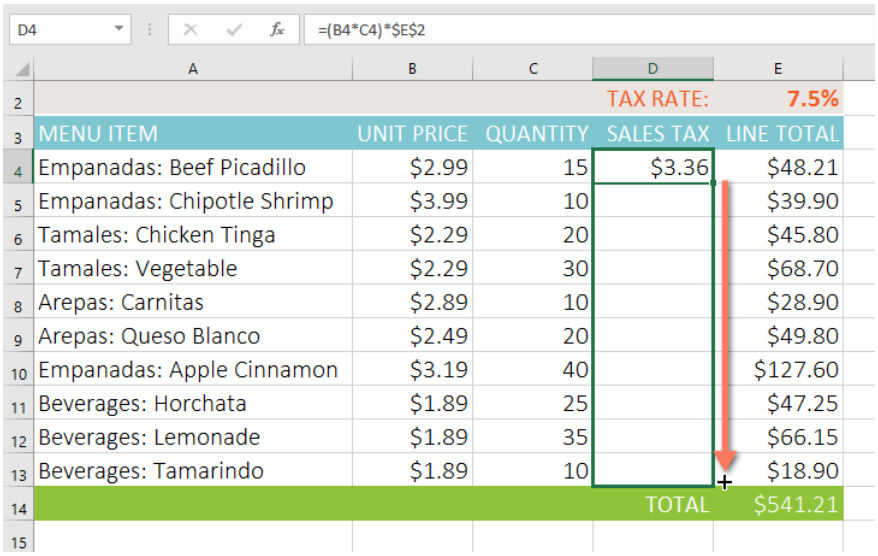
3. Press **Enter** on the keyboard. The formula will perform the calculation, and the result will be displayed in the cell.

4. Locate the fill handle in the bottom right corner of the desired cell. The example will locate the fill handle for cell **D4.**



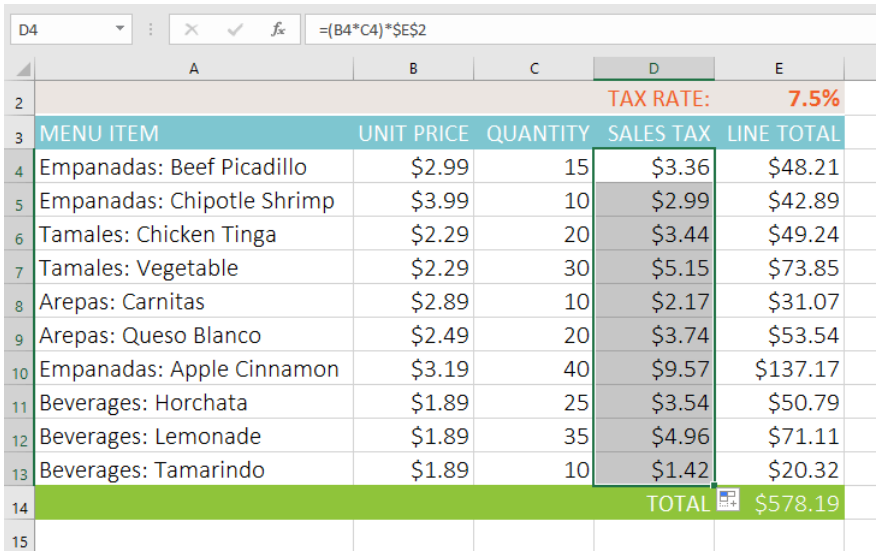
	A	B	C	D	E
2				TAX RATE:	7.5%
3	MENU ITEM	UNIT PRICE	QUANTITY	SALES TAX	LINE TOTAL
4	Empanadas: Beef Picadillo	$2.99	15	$3.36	$48.21
5	Empanadas: Chipotle Shrimp	$3.99	10		$39.90
6	Tamales: Chicken Tinga	$2.29	20		$45.80
7	Tamales: Vegetable	$2.29	30		$68.70
8	Arepas: Carnitas	$2.89	10		$28.90
9	Arepas: Queso Blanco	$2.49	20		$49.80
10	Empanadas: Apple Cinnamon	$3.19	40		$127.60
11	Beverages: Horchata	$1.89	25		$47.25
12	Beverages: Lemonade	$1.89	35		$66.15
13	Beverages: Tamarindo	$1.89	10		$18.90
14				TOTAL	$541.21
15					

5. Click and drag the fill handle into the cells you want to fill (cells **D5:D13** in the example).



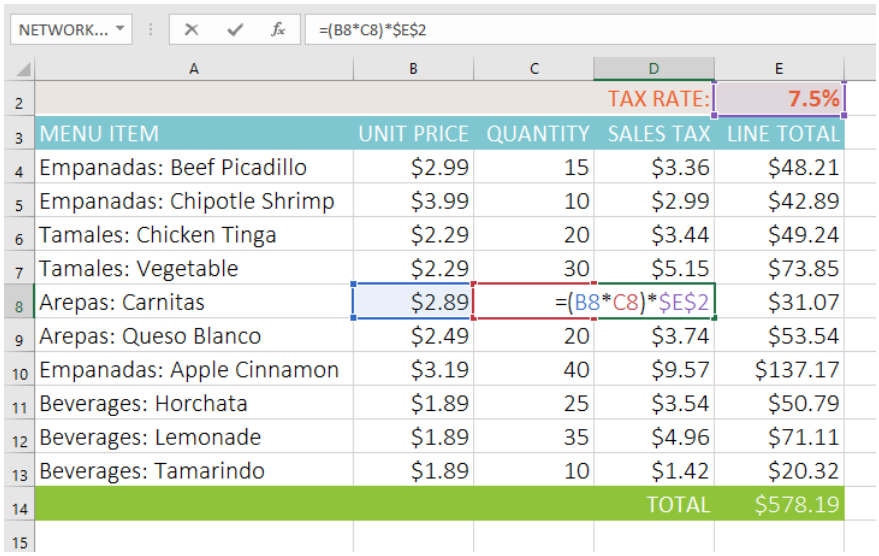
	A	B	C	D	E
2				TAX RATE:	7.5%
3	MENU ITEM	UNIT PRICE	QUANTITY	SALES TAX	LINE TOTAL
4	Empanadas: Beef Picadillo	$2.99	15	$3.36	$48.21
5	Empanadas: Chipotle Shrimp	$3.99	10		$39.90
6	Tamales: Chicken Tinga	$2.29	20		$45.80
7	Tamales: Vegetable	$2.29	30		$68.70
8	Arepas: Carnitas	$2.89	10		$28.90
9	Arepas: Queso Blanco	$2.49	20		$49.80
10	Empanadas: Apple Cinnamon	$3.19	40		$127.60
11	Beverages: Horchata	$1.89	25		$47.25
12	Beverages: Lemonade	$1.89	35		$66.15
13	Beverages: Tamarindo	$1.89	10		$18.90
14				TOTAL	$541.21
15					

6. Release the mouse button. The formula will be copied to the selected cells with absolute references, and the values ??in each cell will be calculated.



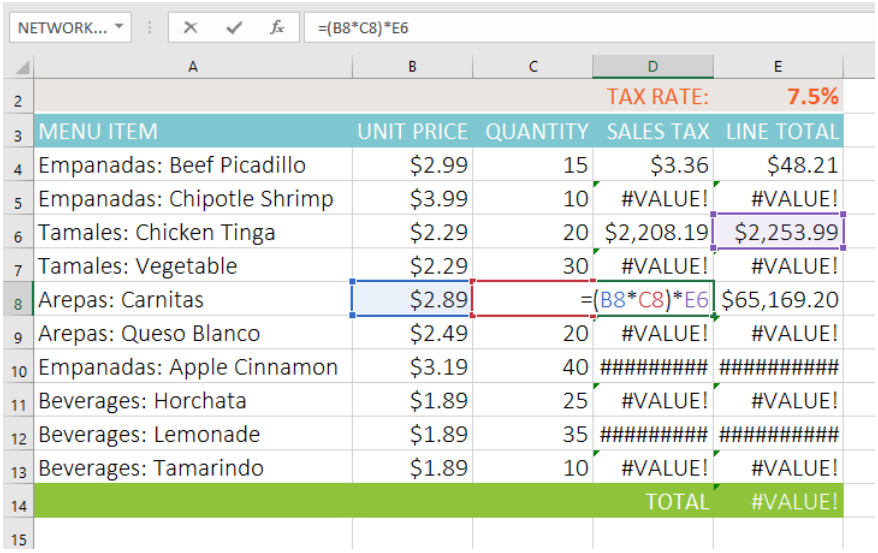
	A	B	C	D	E
2				TAX RATE:	7.5%
3	MENU ITEM	UNIT PRICE	QUANTITY	SALES TAX	LINE TOTAL
4	Empanadas: Beef Picadillo	$2.99	15	$3.36	$48.21
5	Empanadas: Chipotle Shrimp	$3.99	10	$2.99	$42.89
6	Tamales: Chicken Tinga	$2.29	20	$3.44	$49.24
7	Tamales: Vegetable	$2.29	30	$5.15	$73.85
8	Arepas: Carnitas	$2.89	10	$2.17	$31.07
9	Arepas: Queso Blanco	$2.49	20	$3.74	$53.54
10	Empanadas: Apple Cinnamon	$3.19	40	$9.57	$137.17
11	Beverages: Horchata	$1.89	25	$3.54	$50.79
12	Beverages: Lemonade	$1.89	35	$4.96	$71.11
13	Beverages: Tamarindo	$1.89	10	$1.42	$20.32
14				TOTAL	$578.19
15					

You can double-click on filled cells to check the accuracy of the formulas. Absolute references must be the same for each cell, while other references are relative to the cell's row.



	A	B	C	D	E
2				TAX RATE:	7.5%
3	MENU ITEM	UNIT PRICE	QUANTITY	SALES TAX	LINE TOTAL
4	Empanadas: Beef Picadillo	$2.99	15	$3.36	$48.21
5	Empanadas: Chipotle Shrimp	$3.99	10	$2.99	$42.89
6	Tamales: Chicken Tinga	$2.29	20	$3.44	$49.24
7	Tamales: Vegetable	$2.29	30	$5.15	$73.85
8	Arepas: Carnitas	$2.89	=(B8*C8)*E2		$31.07
9	Arepas: Queso Blanco	$2.49	20	$3.74	$53.54
10	Empanadas: Apple Cinnamon	$3.19	40	$9.57	$137.17
11	Beverages: Horchata	$1.89	25	$3.54	$50.79
12	Beverages: Lemonade	$1.89	35	$4.96	$71.11
13	Beverages: Tamarindo	$1.89	10	$1.42	$20.32
14				TOTAL	$578.19
15					

Make sure to include the dollar sign (**$**) whenever you are making an absolute reference across multiple cells. The dollar sign was omitted in the example below. This caused Excel to interpret it as a relative reference, producing an incorrect result when copied to other cells.



Using cell references across multiple worksheets

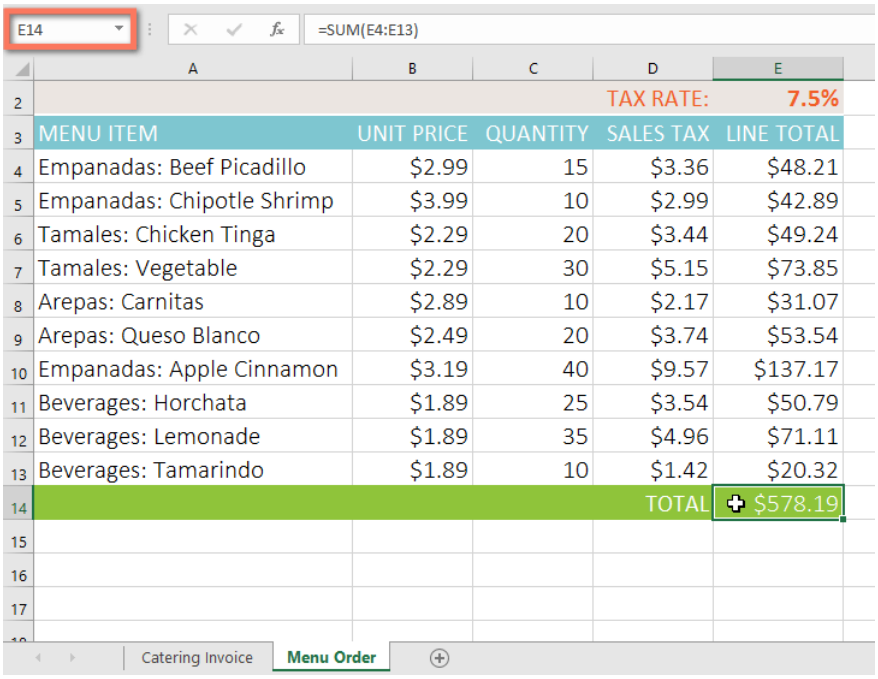
Excel allows you to reference any cell on any worksheet, which can be especially useful if you want to reference a specific value from one worksheet to another. To do this, simply begin the cell reference with the worksheet name, followed by an exclamation mark (**!**). For example, if you want to reference cell **A1** on **Sheet1** , its cell reference would be **Sheet1!A1.**

Note that if the worksheet name contains spaces, you will need to include double quotes (**''**) around the name. For example, if you want to reference cell **A1** on a worksheet named **July Budget** , its cell reference would be **'July Budget'!A1.**

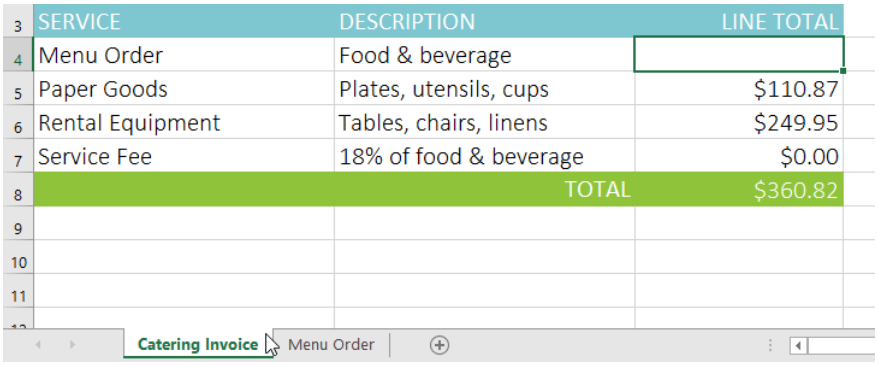
How to reference cells on spreadsheets

The example below illustrates a cell whose value is calculated across two worksheets. This allows the exact same value to be used on two different worksheets without rewriting formulas or copying data.

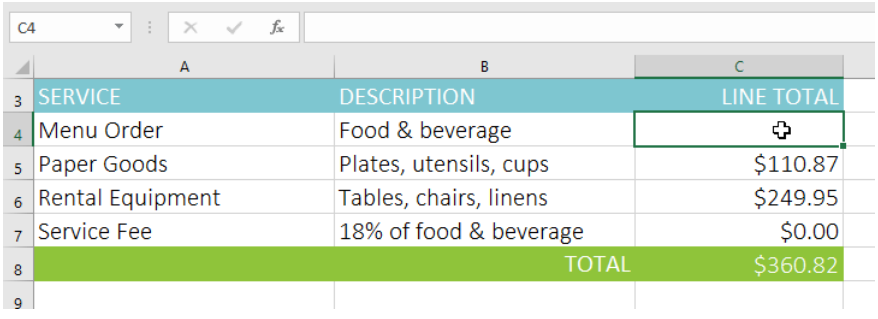
1. Locate the cell you want to reference and note the worksheet containing that cell. For example, to reference cell **E14 on the Menu Order** worksheet .



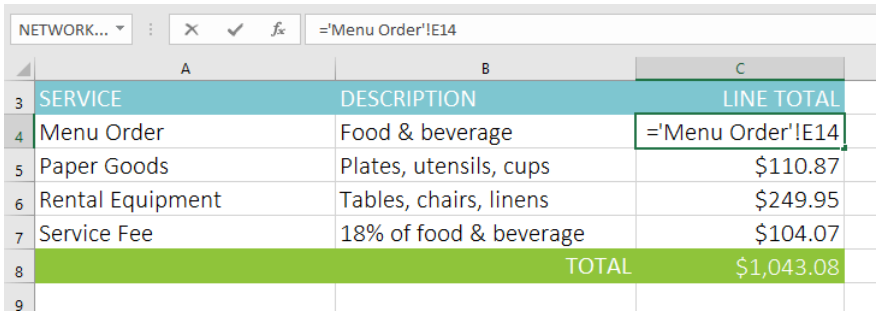
2. Navigate to the desired worksheet. For example, we would select the **Catering Invoice worksheet.**



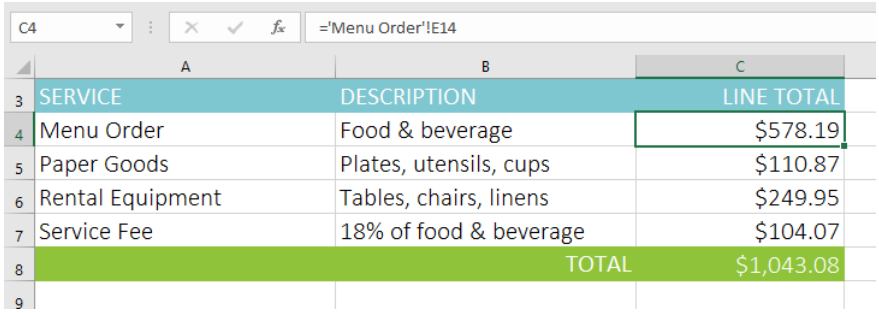
3. Locate and select the cell where you want the value to appear. For example, we would select cell **C4.**



4. Enter the equals sign (=), the worksheet name followed by the exclamation mark (!) and the cell address. For example, you would enter **='Menu Order'!E14.**

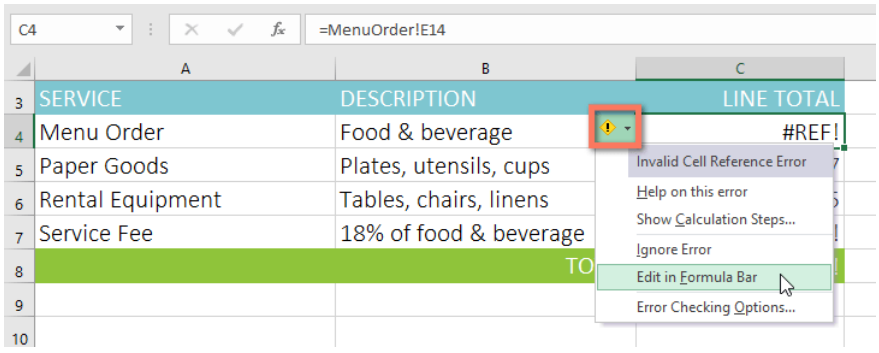


5. Press **Enter** on your keyboard. The value of the referenced cell will appear. Now, if the value of cell **E14** changes on the **Menu Order** worksheet , it will be automatically updated on the Catering Invoice worksheet.



If you rename your worksheet later, the cell reference will be automatically updated to reflect the new worksheet name.

If you enter the wrong worksheet name, a **#REF!** error will appear in the cell. In the example below, the worksheet name was misspelled. To edit, ignore, or check for the error, click the **Error** button next to the cell and select an option from the menu.



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