# Microsoft Excel - Functions

Cell References

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# Overview

Most of the formulas used include references to cells or ranges (e.g. = B2+B3 or =SUM(B2:B7)).

These references enable your formulas to work dynamically with the data contained in those cells or ranges.

When you use a cell reference in a formula, you can use three types of references:

- Relative;
- Absolute;
- Mixed.

The type of cell reference is extremely important if you copy the formula to other cells.

# Relative References

**Relative Reference**: The row and column references change when the formula is copied and filled to other cells because the references are actually offsets from the current row and column.

By default, Excel creates relative cell references in formulas.



The formulas for D4 and D5 are created by copying and pasting D3. The cell references in the formula are relative to the position of the cell containing them, and are automatically updated for the new location.

# Absolute References

Unlike relative references, **absolute references** do not change when copied or filled.

An absolute reference is designated in a formula by the addition of a **dollar sign ($)** before the column and row or by pressing the **F4** key.

| $A$2 | The column and the row do not change when copied |
|------|--------------------------------------------------|

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Invoice | | | | |
| 2 | **Product** | **Price** | **Quantity** | **Amount** | **Sales Tax** |
| 3 | DVDs | 12.99 | 5 | 64.95 | =D3*$B$7 |
| 4 | Notepads | 2.95 | 4 | 11.8 | =D4*$B$7 |
| 5 | Books | 15.45 | 3 | 46.35 | =D5*$B$7 |
| 6 | | | | 123.1 | |
| 7 | Sales Tax | 7.50% | | | |

By copy this formula down into cells E4 and E5, the reference $B$7 doesn't change, so the results are correct

# Mixed References

**Mixed Reference**: Either the row or the column reference is relative, and the other is absolute.

| A$2 | The row does not change when copied |
|-----|-------------------------------------|
| $A2 | The column does not change when copied |

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | Invoice | | | | | | |
| 2 | **Product** | **Price** | **Quantity** | **Amount** | **Sales Tax** | **Discounted Amounts** | |
| 3 | DVDs | 12.99 | 5 | 64.95 | =D3*$B$7 | =$D3*0.10 | =$D3*0.15 |
| 4 | Notepads | 2.95 | 4 | 11.8 | =D4*$B$7 | =$D4*0.10 | =$D4*0.15 |
| 5 | Books | 15.45 | 3 | 46.35 | =D5*$B$7 | =$D5*0.10 | =$D5*0.15 |
| 6 | | | | 123.1 | | | |
| 7 | Sales Tax | 7.50% | | | | | |

# Referencing Cells outside the Worksheet

Formulas can also refer to cells in other worksheets. The worksheet could also be in a different workbook.

- **Referencing cells in other worksheets**

To use a reference to a cell in another worksheet in the same workbook, use this format:

=SheetName!CellAddress

=A1*Sheet2!A1

- **Referencing cells in other workbooks**

To refer to a cell in a different workbook, use this format:

=[WorkbookName]SheetName!CellAddress

=[Budget.xlsx]Sheet1!A1