

## AND,OR, NOT

And, OR and Not are considered logical functions and are usually found nested in other formulas such as an IF. The three functions return either a True or False, which can be used in other calculations to continue a calculation or decision.

**The AND, OR and NOT functions are usually not used alone - instead one of these functions is usually housed within an IF. Combined it can be very powerful as the AND and the OR functions allow you to test up to 30 different conditions. An IF and AND together will be true if all the conditions are met. An IF and OR together will be true as long as one of the conditions is true.**

The syntax for these three functions is

Function (logical1, logical2....)

- **And** tests whether all the arguments are TRUE
- **OR** tests if any of the arguments are TRUE
- **Not** tests whether the criterion is not true – for a single test

AND as well as OR allow you to test up to **30** conditions while NOT only allows for one variable or one test

For example, I would use the following nested function of IF and AND if I wanted to see if my customer qualified for a discount. To qualify the coffee beans had to be from Tanzania (C8) and the purchase had to be  $\geq 50$  (e8). If both cells met the criteria than the resulting answer would calculate the new price after discount.

AND =IF(AND(C8="Tanzania",E8>=50),F8\*90%,F8)

	A	B	C	D	E	F	G	H
1	Determine what the final sales amount should be in Column G							
2	If the Product is Tanzania <b>and</b> the quantity sold is greater than or equal to 50, they are entitled to the 10% discount							
3								
4	Change it so that the discount is given if it is Tanzania <b>or</b> a quantity of 50 or more and note the changes							
5	<b>Java Joe's Wholesale Coffee</b>							
6								
7	Customer	Date	Product	Price/lb	Quantity Sold	Total Sales	Final Sales after Discount	Net Discount
8	Starbucks	8/1/2000	Tanzania	4.99	75	=IF(AND(C8="Tanzania",E8>=50),F8*90%,F8)		
9	Barneys	8/1/2000	Tanzania	4.99	10	49.9		49.9
10	Java Joe	8/1/2000	Tanzania					
11	Smokin' Si	8/1/2000	Tanzania					
12	Starbucks	8/1/2000	French Ro					
13	Barneys	8/1/2000	French Ro					
14	Java Joe	8/1/2000	French Ro					
15	Smokin' Si	8/1/2000	French Ro					
16	Starbucks	8/1/2000	Blue Hawa					
17	Barneys	8/1/2000	Columbian					
18	Java Joe	8/1/2000	Columbian					
19	Smokin' Si	8/1/2000	Columbian					
20	Starbucks	8/1/2000	Columbian					

**Function Arguments** ✕

AND

**Logical1** C8="Tanzania" = TRUE

Logical2 E8>=50 = TRUE

Logical3  = logical

= TRUE

Checks whether all arguments are TRUE, and returns TRUE if all arguments are TRUE.

**Logical2:** logical1,logical2,... are 1 to 30 conditions you want to test that can be either TRUE or FALSE and can be logical values, arrays, or references.

Formula result = 336.825

**Excel Tip: Enter the True/False pieces first and then do the test!**