# DAX Cheat Sheet

This cheat sheet will show you the most used DAX functions and operators that can be combined to build formulas and expressions in a more effective way.

**Remember:** DAX formulas always start with an equal sign (=). You can provide any expression that evaluates to a scalar, or an expression that can be converted to a scalar after the equals sign.

## Basic Aggregate and Math functions

| Problem | Calculation Expression |
|---|---|
| Total Sales Calculation | **Calculated measure using SUM to aggregate a column**<br>Total Sales = SUM('TableName'[SalesAmount]) |
| Total Cost Calculation | **Calculated measure using SUM to aggregate a column**<br>Total Cost = SUM('TableName'[Cost]) |
| Profit Calculation | **Calculated measure using two previously created calculated measures to determine profit**<br>Profit = [Total Sales] - [Total Cost] |
| Profit Margin | **Calculated measure using two previously created calculated measures to determine profit margin, the DIVIDE function is used to perform the division**<br>Profit Margin = DIVIDE( [Profit], [Total Sales]) |
| Transaction Count | **Calculated measure that returns a count of all rows in a table, ultimately, many times this simple calculation is used to return transaction counts**<br>Transactions = COUNTROWS('Table') |
| Related Table Count | **Returns the total rows in a related table. For example, total transactions by Product**<br>Transactions = COUNTROWS(RELATEDTABLE('TABLE')) |

# Month To Date Sales

- Month-to-date (MTD): a period starting at the beginning of the current calendar month and ending at the current date.
- Month-to-date is used in various contexts, typically for recording results of an activity in the time between a date (exclusive since this day may not yet be "complete") and the beginning of the current month.
- **Example:** If today is the 15th of the month, and your manager asks you for the month to date sales figures, you will want to add your sales from the 1st of the month up to the 14th (as the 15th is not complete yet).

| Problem | Calculation Expression |
|---|---|
| MTD Sales | **Calculates Total Sales for all days in the current month up to the maximum day in the selection**<br>`MTD Sales = TOTALMTD( [Total Sales], 'DateTable'[DateColumn] )` |
| MTD Sales (Direct Query) | **Calculates Total Sales for all days in the current month up to the maximum day in the selection**<br>`MTD Sales =`<br>`  CALCULATE (`<br>`  [Total Sales],`<br>`  FILTER (`<br>`  ALL ( 'DateTable' ),`<br>`  'DateTable'[DateYear] = MAX ( 'DateTable'[DateYear] ) &&`<br>`  'DateTable'[DateMonth] = MAX ( 'DateTable'[DateMonth] ) &&`<br>`  'DateTable'[Date] <= MAX ( 'DateTable'[Date] )`<br>`  )`<br>`  )` |

# Year To Date Sales

- Year To Date (YTD) sales formulas: the amount of profit (or loss) realized by an investment since the first trading day of the current calendar year.
- YTD calculations are commonly used by investors and analysts to assess the performance of a portfolio or to compare the recent performance of a group of stocks.
- Using the YTD period sets a common time frame for assessing the performance of securities against each other and their benchmarks. A YTD period is also useful for measuring price movements relative to other data, such as the economic indicators.
- **Example:** Year to date value of sales could be the summary of all sales from the 1st of January of that year to a specified date.

| Problem | Calculation Expression |
|---|---|
| YTD Sales | **Calculates Total Sales for all days in the year up to the maximum day in the selection**<br>YTD Sales = TOTALYTD( [Total Sales], 'DateTable'[DateColumn] ) |
| YTD Sales (Fiscal Calendar) | **This calculation uses an optional third parameter specifying the fiscal year end date**<br>YTD Sales = TOTALYTD( [Total Sales], 'DateTable'[DateColumn], "05/31" ) |
| YTD Sales (Direct Query) | **Calculates Total Sales for all days in the year up to the maximum day in the selection**<br>YTD Sales: =<br>CALCULATE (<br>[Total Sales],<br>FILTER (<br>ALL ( 'DateTable' ),<br>'DateTable'[DateYear] = MAX ( 'DateTable'[DateYear] ) &&<br>'DateTable'[Date] <= MAX ( 'DateTable'[Date] )<br>)<br>) |

# Prior Year Sales

- Prior Year Sales formulas: used to track your business's performance by comparing a statistic for a select period with the same period from the previous year.

- **Example:** Let's say your business revenue rose 25% last month. Before you celebrate, check that against the income from the same month last year. Maybe your sales usually rise this time of year. If sales typically rise 35% this month, then at 25% your revenue is down year-over-year. Your business is doing worse, not better.

| Problem | Calculation Expression |
|---|---|
| Prior Year Profit | **Calculates Profit for all days in the Year prior to the last year in the selection. Limited to the last day of the selection**<br>Prior Year Profit = CALCULATE ( [Profit], SAMEPERIODLASTYEAR'DateTable'[DateColumn] ) |
| Prior Year Profit (Direct Query) | **Calculates Profit for all days in the Year prior to the last year in the selection. Limited to the last day of the selection**<br>**Prior Year Profit =**<br>CALCULATE (<br>[Profit],<br>FILTER (<br>ALL ( 'DateTable' ),<br>*'DateTable'[Year]* = MAX ( *'DateTable'[Year]* ) - 1<br>)<br>) |
| Year over Year Profit | **Calculated measure using two previously created calculated measures to determine YoY profit**<br>YoY Profit = [Profit] - [Prior Year Profit] |
| Last Year YTD Sales | **This calculation measures last year YTD sales**<br>Last YTD Sales = CALCULATE ( [YTD Sales], SAMEPERIODLASTYEAR('DateTable'[DateColumn] ) ) |
| Total Sales for all Countries | **This calculation uses calculate to return all countries in the calculation regardless of the filter context**<br>Total Sales All Countries = CALCULATE ( [Total Sales], ALL('Geography Table'[Country] ) ) |
| Percent of Total Calculation | **This calculation uses two measures previously created to create a percent of total calculation**<br>Percent of Total = DIVIDE([Total Sales], [Total Sales All Countries]) |

# Moving Totals

- The Moving Average (MA) formula: a technique to get an overall idea of the trends in a data set; this technique is an average of any subset of numbers.
- The Moving Average is very useful for forecasting long-term trends. You can calculate it for a certain period of time.
- **For example:** If you have sales data for a twenty-year period, you can calculate a five-year moving average, a four-year moving average, and so on.

| Problem | Calculation Expression |
|---|---|
| Rolling 12 Month Sales | **Calculated measure that returns a rolling 12 months total for Profit**<br><br>**Rolling 12 Months Profit =**<br>CALCULATE ( [Profit],<br>DATESBETWEEN('DateTable'[DateColumn] ,<br>NEXTDAY(<br>SAMEPERIODLASTYEAR(<br>LASTDATE(DateTable'[DateColumn] ))),<br>LASTDATE('DateTable'[DateColumn])))) |
| 7 Day Moving Average Profit | **This calculation generates the daily moving average. The number of days can be changed accordingly**<br><br>**7 Day Moving Average =**<br>AVERAGEX (<br>FILTER (<br>ALL ( 'DateTable' ),<br>'DateTable'[FullDateAlternateKey] > ( MAX ('DateTable'[FullDateAlternateKey] ) - 7 ) &&<br>'DateTable'[FullDateAlternateKey] > <= MAX ('DateTable'[FullDateAlternateKey] )<br>),<br>[Profit]) |
| Country Rank | **Calculated measure to rank a specific column in a table by a measure. In this measure Country from the geography table is being ranked by the measure [Total Sales]**<br><br>Country Rank = RANKX( ALL ('GeographyTable'[Country]), [Total Sales],,,Skip) |