

◇ Puzzle 1: Confusing Totals

Problem: You have a calculated column/measure:

```
Sales per Qty = [Total Sales] / [Total Quantity]
```

The row-level looks fine, but the **total row is wrong**.

Why?

- Totals in DAX are not a sum of row values. They are calculated again at the **total context** (all rows combined).
- So at the total row, it does:
`SUM(Sales) ÷ SUM(Quantity)`
instead of summing the ratios.

☑ **Fix (use SUMX to force row context):**

```
Sales per Qty Correct =  
DIVIDE(  
    SUMX(Products, Products[Sales] / Products[Quantity]),  
    COUNTROWS(Products)  
)
```

or if you want **weighted average**:

```
Weighted Sales per Qty =  
DIVIDE(SUM(Sales[Sales]), SUM(Sales[Quantity]))
```

◇ Puzzle 2: Filtered vs. Unfiltered Totals

Task: Show sales per category + sales ignoring filters.

```
Total Sales = SUM(Sales[SalesAmount])
```

```
Total Sales All Categories =  
CALCULATE(  
    [Total Sales],  
    ALL(Sales[Category])  
)
```

```
% of Total =  
DIVIDE([Total Sales], [Total Sales All Categories])
```

◇ Puzzle 3: Changing Context with Slicers

Why does card change?

- A card visual respects filters from slicers (Country).

Ignore slicer with ALL():

```
Total Sales Ignore Country =  
CALCULATE([Total Sales], ALL(Sales[Country]))
```

◇ Puzzle 4: Misleading Average

Problem:

```
Average Sales = [Total Sales] / [Total Orders]
```

is wrong at grouped levels because it divides aggregated totals, not per-row values.

☑ Fix using AVERAGEX():

```
Average Sales =  
AVERAGEX(  
    Sales,  
    Sales[SalesAmount] / Sales[OrderID]  
)
```

or if one row = one order:

```
Average Sales per Order =  
DIVIDE([Total Sales], DISTINCTCOUNT(Sales[OrderID]))
```

◇ Puzzle 5: Highlight Top Product per Category

Solution with RANKX:

```
Product Rank by Category =  
RANKX(  
    FILTER(Sales, Sales[Category] = EARLIER(Sales[Category])),  
    [Total Sales],  
    ,  
    DESC,  
    DENSE  
)
```

Then filter the visual: Product Rank by Category = 1.

◇ Puzzle 6: Unexpected Blank Values

Measure:

```
Sales in France =  
CALCULATE(SUM(Sales[Sales]), Sales[Country] = "France")
```

Problem:

- If a customer never bought in France → blank.

- Or if relationship is missing between tables (Customers ↔ Sales).

☒ **Fix:** Force 0 instead of blank:

```
Sales in France =  
COALESCE(  
    CALCULATE(SUM(Sales[Sales]), Sales[Country] = "France"),  
    0  
)
```

◇ Puzzle 7: Time Intelligence Confusion

Previous month sales:

```
Sales PM =  
CALCULATE(  
    [Total Sales],  
    PREVIOUSMONTH('Date'[Date])  
)
```

Edge cases (missing months):

Use DATEADD instead:

```
Sales PM =  
CALCULATE(  
    [Total Sales],  
    DATEADD('Date'[Date], -1, MONTH)  
)
```

☒ Requires proper Date table (continuous).

◇ Puzzle 8: Row-Level Calculation

Why SUMX()?

- SUM(Sales[Quantity] * Sales[Discount]) doesn't work because SUM cannot multiply across rows.
- SUMX iterates row by row.

```
Total Discount =  
SUMX(  
    Sales,  
    Sales[Quantity] * Sales[Discount per Unit]  
)
```

◇ Puzzle 9: Rank with Ties

RANKX solution:

```
City Rank =  
RANKX(  
    ALL(Sales[City]),  
    [Total Sales],  
    ,  
    DESC,  
    DENSE  
)
```

- DENSE → ties get same rank.
- Change to SKIP for gaps in rank.

◇ Puzzle 10: Dynamic Titles and KPIs

```
Dynamic Title =  
"Sales for " & SELECTEDVALUE(Sales[Country], "All Countries")
```

Use in a Card visual or Title text in formatting.