🧠 1. What does DAX stand for?

DAX stands for **Data Analysis Expressions**.
It's a formula language used in **Power BI**, **Excel Power Pivot**, and **Analysis Services Tabular Models** to create custom calculations and aggregations.

➕ 2. Write a DAX formula to sum the Sales column.

If you're creating a **measure**:

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

If you're creating a **calculated column**:

```
= Sales[Sales]
```

(Each row just returns the Sales value for that row — usually not useful for totals.)

⚖️ 3. What is the difference between a calculated column and a measure?

Feature	Calculated Column	Measure
Evaluation	Row by row	On aggregated data
Storage	Stored in the model	Calculated on the fly
Use case	Adds new column to data table	Used for dynamic calculations (e.g., totals, averages)
Performance	Slower, increases model size	Faster, more efficient

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💰 4. Use the DIVIDE function to calculate Profit Margin (Profit/Sales).

```
Profit Margin = DIVIDE(Sales[Profit], Sales[Sales], 0)
```

(The third argument `0` is the alternate result if division by zero occurs.)

🔢 5. What does COUNTROWS() do in DAX?

`COUNTROWS()` returns the **number of rows** in a table or table expression.
Example:

```
Number of Products = COUNTROWS(Products)
```

💵 6. Create a measure: Total Profit that subtracts total cost from total sales

```
Total Profit = SUM(Sales[Sales]) - SUM(Sales[Cost])
```

📊 7. Write a measure to calculate Average Sales per Product.

```
Average Sales per Product =
DIVIDE(
    [Total Sales],
    COUNTROWS(Products),
    0
)
```

🏷️ 8. Use IF() to tag products as "High Profit" if Profit > 1000.

As a **calculated column**:

```
Profit Category =
IF(Sales[Profit] > 1000, "High Profit", "Low Profit")
```

🔁 9. What is a circular dependency error in a calculated column?

A **circular dependency error** happens when a calculated column's formula **depends (directly or indirectly)** on its own result — causing an infinite loop.

Example:

```
Sales[Adjusted] = Sales[Adjusted] + 100
```

This references itself, so Power BI can't compute it.

🌐 10. Explain row context vs. filter context.

Context Type	Description	Example
Row Context	Context of a single row while evaluating a calculated column.	Each row in `Sales` has its own row context.
Filter Context	Filters applied (via slicers, visuals, or CALCULATE) that affect what data is aggregated.	Total Sales for a specific region or month.

🗓️ 11. Write a measure to calculate YTD Sales using TOTALYTD().

```
YTD Sales =
TOTALYTD(
    [Total Sales],
    'Calendar'[Date]
)
```

🔁 12. Create a dynamic measure that switches between Sales, Profit, and Margin.

```
Selected Metric =
SWITCH(
    SELECTEDVALUE(Metrics[MetricName]),
    "Sales", [Total Sales],
    "Profit", [Total Profit],
    "Margin", [Profit Margin],
    BLANK()
)
```

(Here `Metrics` is a table with values "Sales", "Profit", "Margin").

⚡ 13. Optimize a slow DAX measure using variables (VAR).

Instead of:

```
Profit Margin = DIVIDE(SUM(Sales[Profit]), SUM(Sales[Sales]))
```

Use:

```
Profit Margin =
VAR TotalProfit = SUM(Sales[Profit])
VAR TotalSales = SUM(Sales[Sales])
RETURN
DIVIDE(TotalProfit, TotalSales)
```

☑ **Faster and cleaner**, because it computes each aggregation once.

🧩 14. Use CALCULATE() to override a filter

Example: Ignore Region filter and get total sales for all regions:

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

🥇 15. Write a measure that returns the highest sales amount

```
Max Sales = MAX(Sales[Sales])
```

Or across all rows dynamically:

```
Max Sales = MAXX(Sales, Sales[Sales])
```