

Plotting on chart using Excel

1-Main elements of a chart

2-Plotting using scattering type chart

3-Adding elements or chart formatting

- ❖ Chart layout

- ❖ Chart data

- ❖ Axes formatting

- ❖ Adding Trendline & show the equation on chart

- ❖ Changing where vertical axis meets horizontal axis

4-Conclusions

1-Main elements of a chart

A-Chart title

B-x-label and y-label

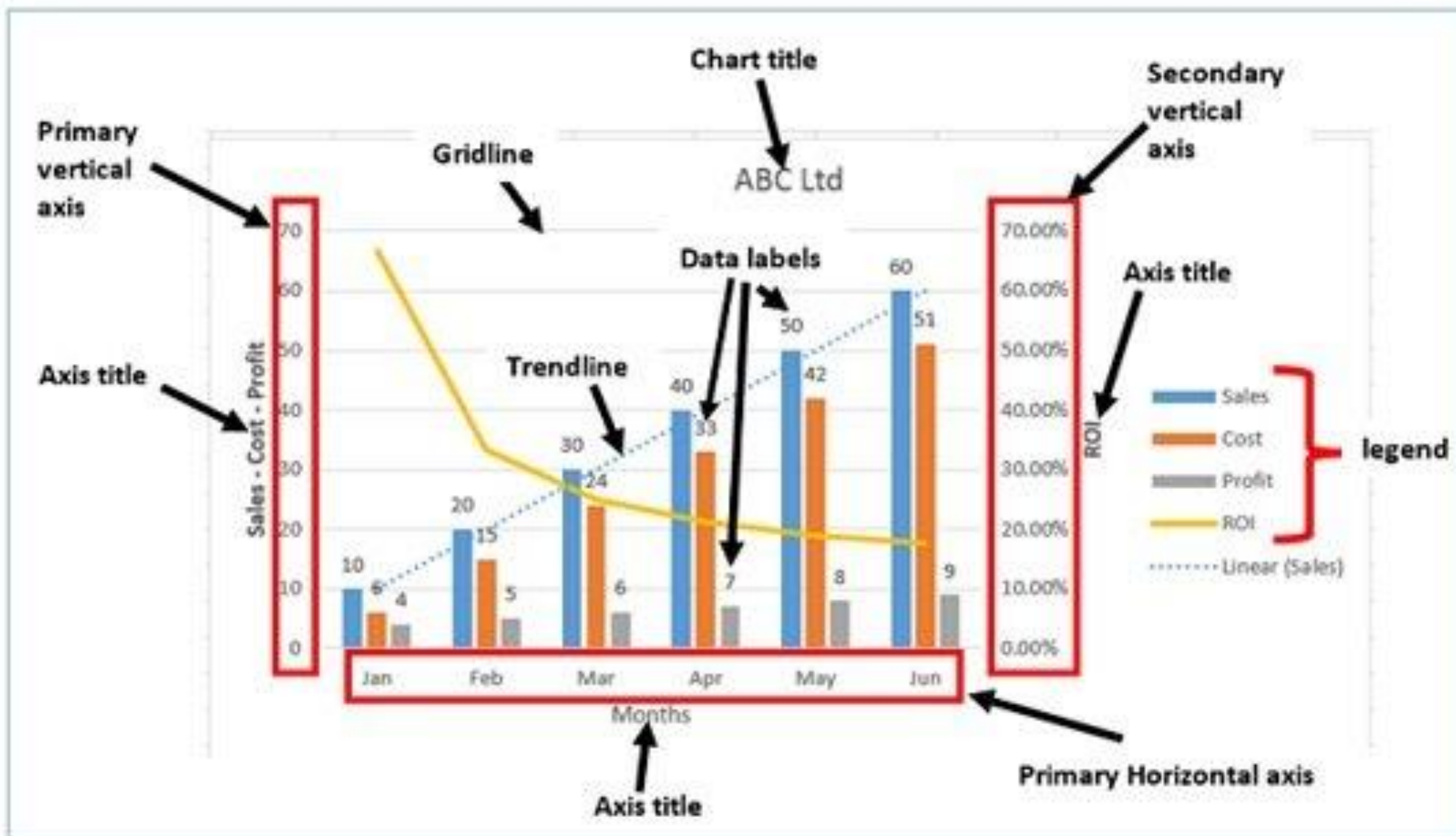
C-Legend

D-Trendline

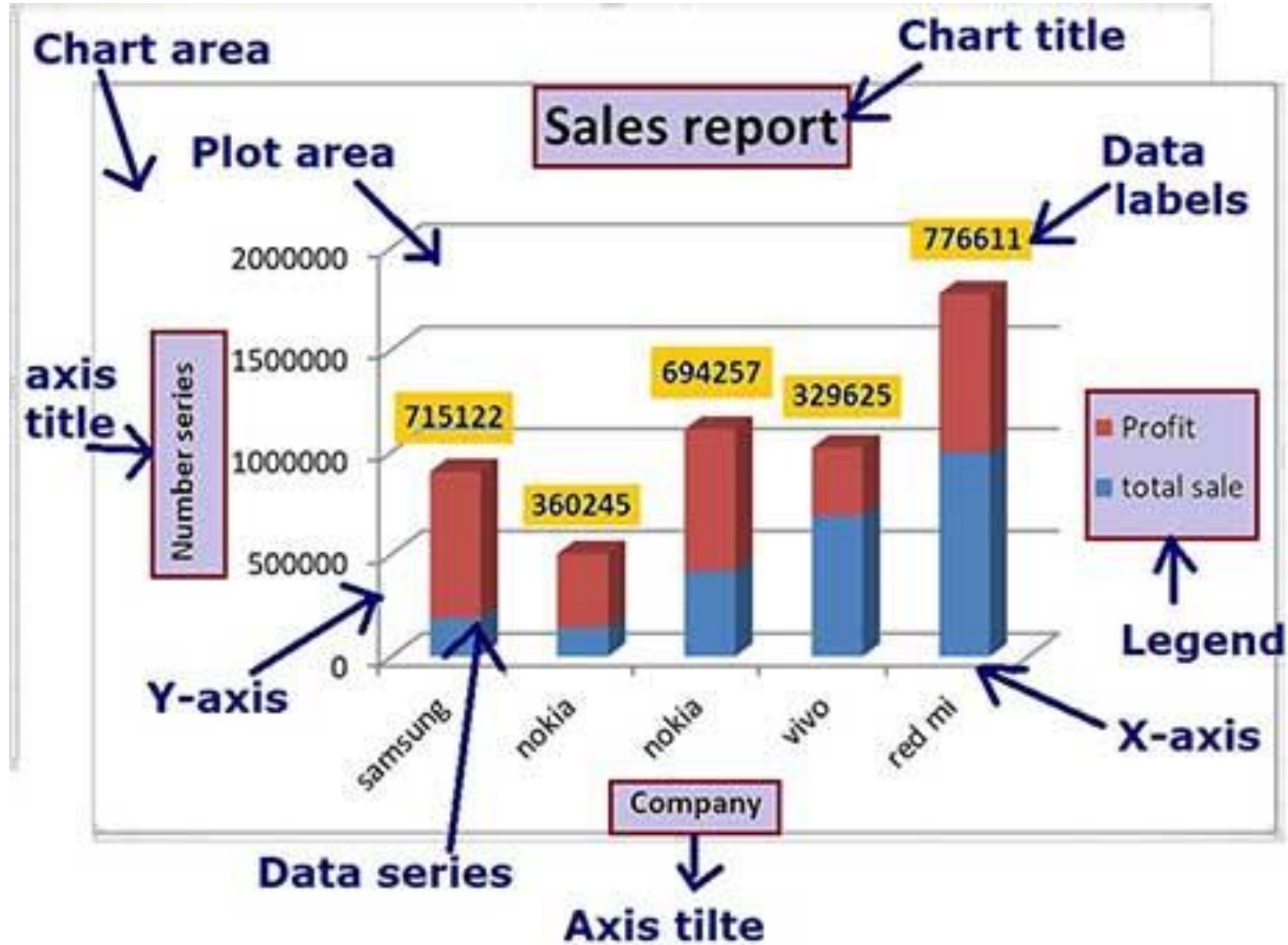
E-Trendline equation and R^2

F-Gridlines

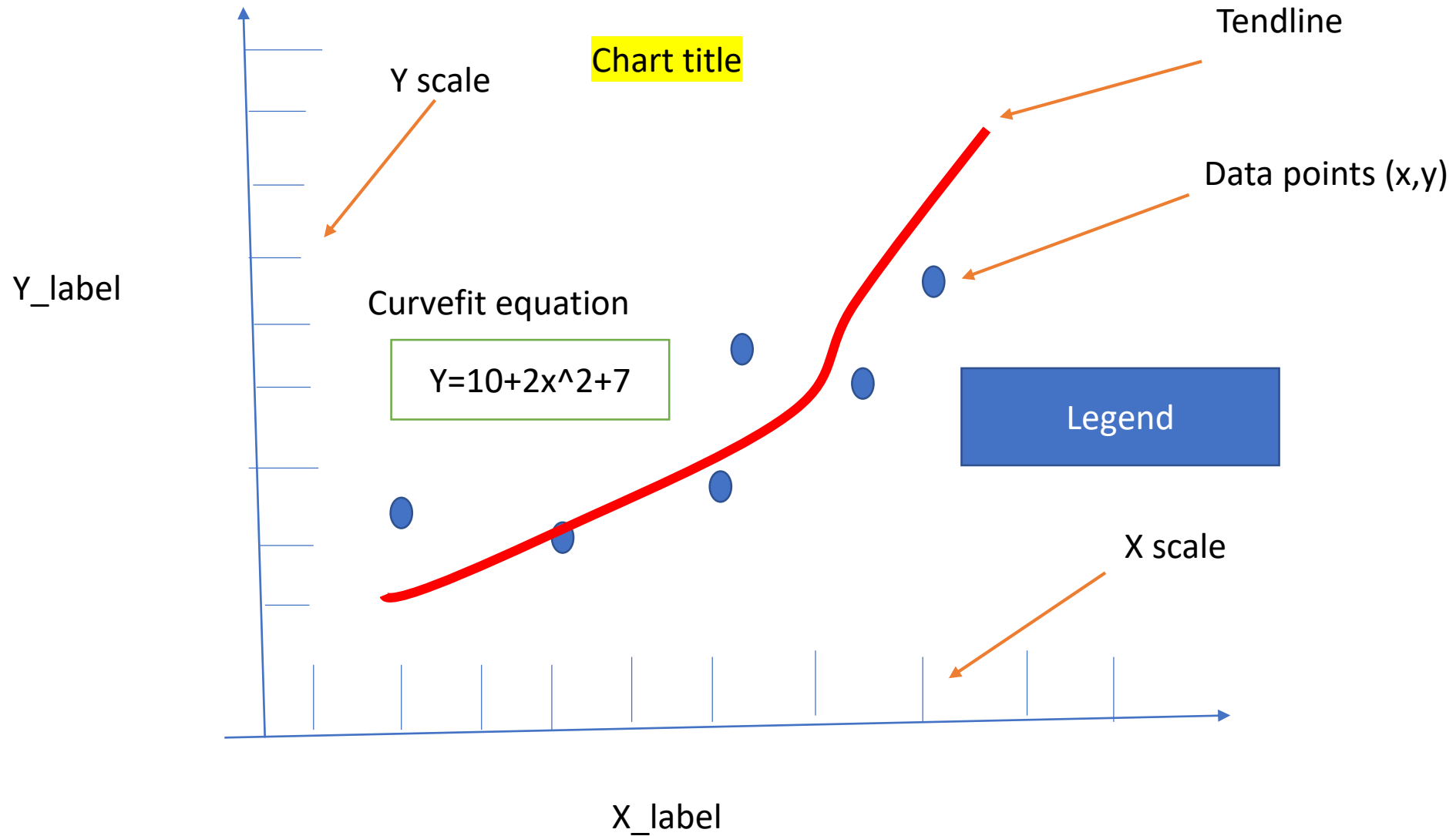
Main elements of Excel Chart



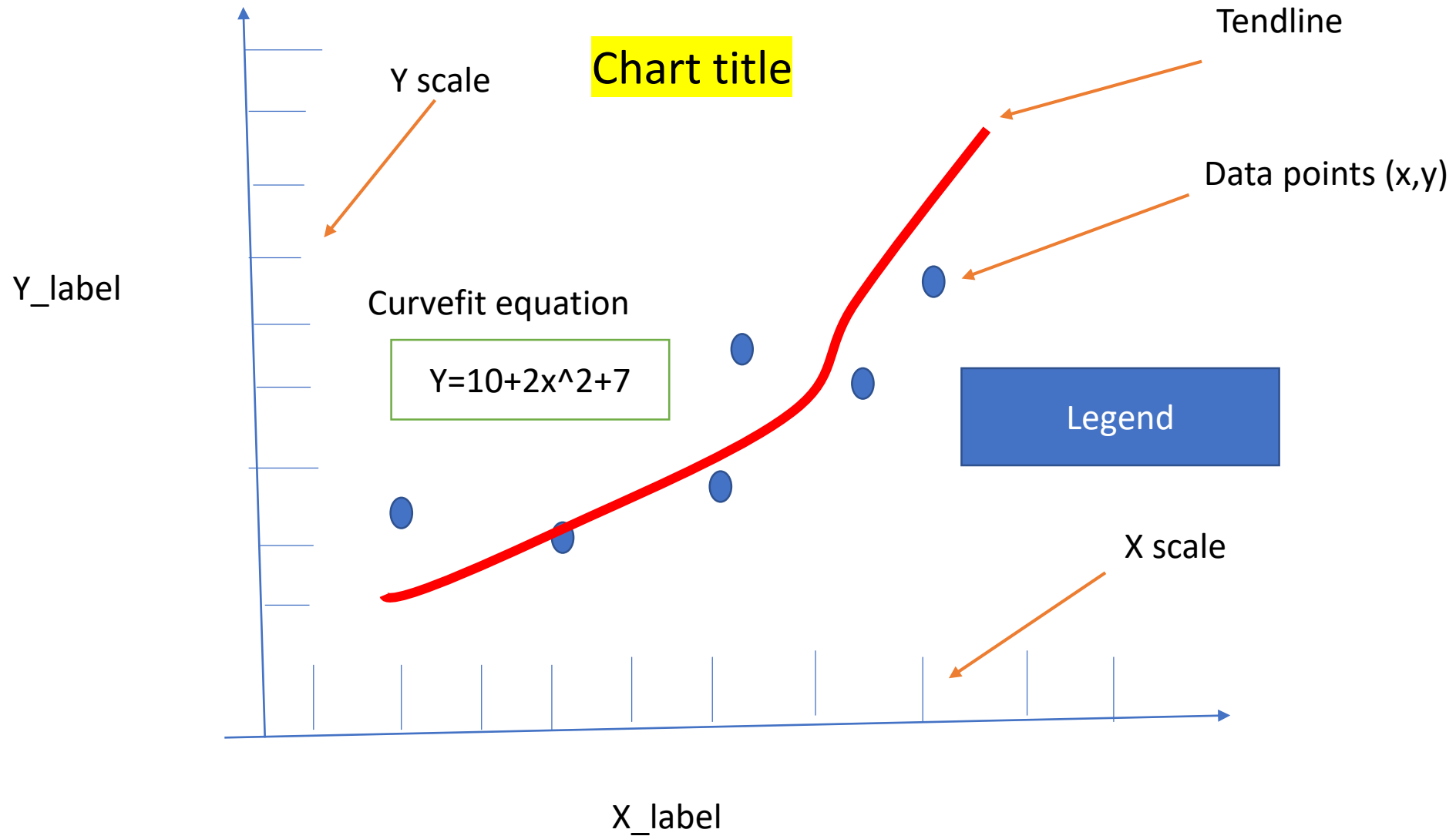
Main elements of Excel Chart



Main elements of Excel Chart



Main elements of Excel Chart



2- Scattering Plot using Excel

1-Select x and y data to be plotted. You can also include the heading (x for x data and y for y data)

2-Go to insert and select scattered data

3-You can through the plus sign on the right corner of the plot to add

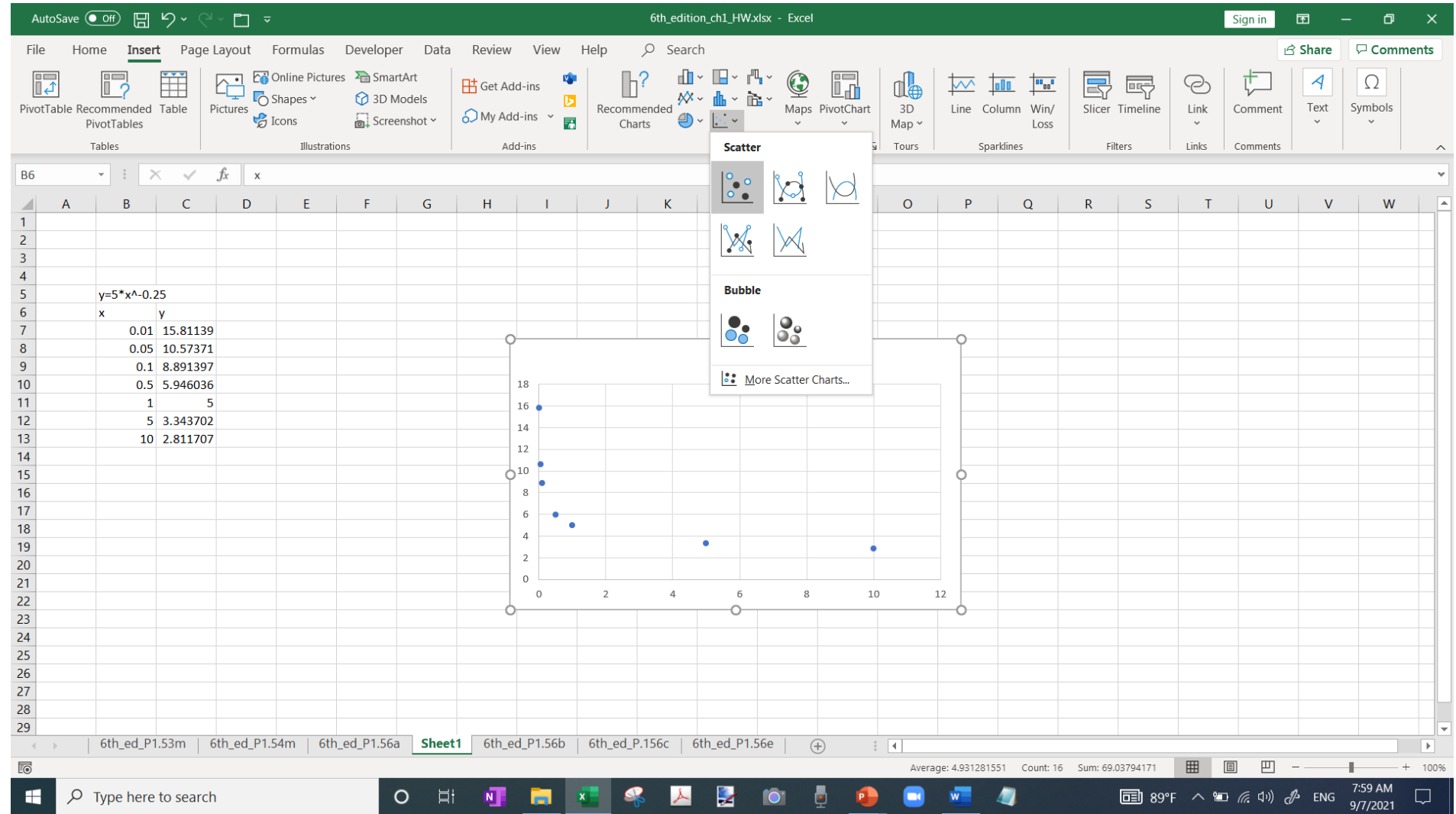
- a) X and y axes labels, Chart title
- b) Trendline & curve-fit equation
- c) More elements

4-If you double click on the graph then a pop up window to the right will be shown where you can play and change how the plotting area changes, how the axis scale can be changed to log or linear and more

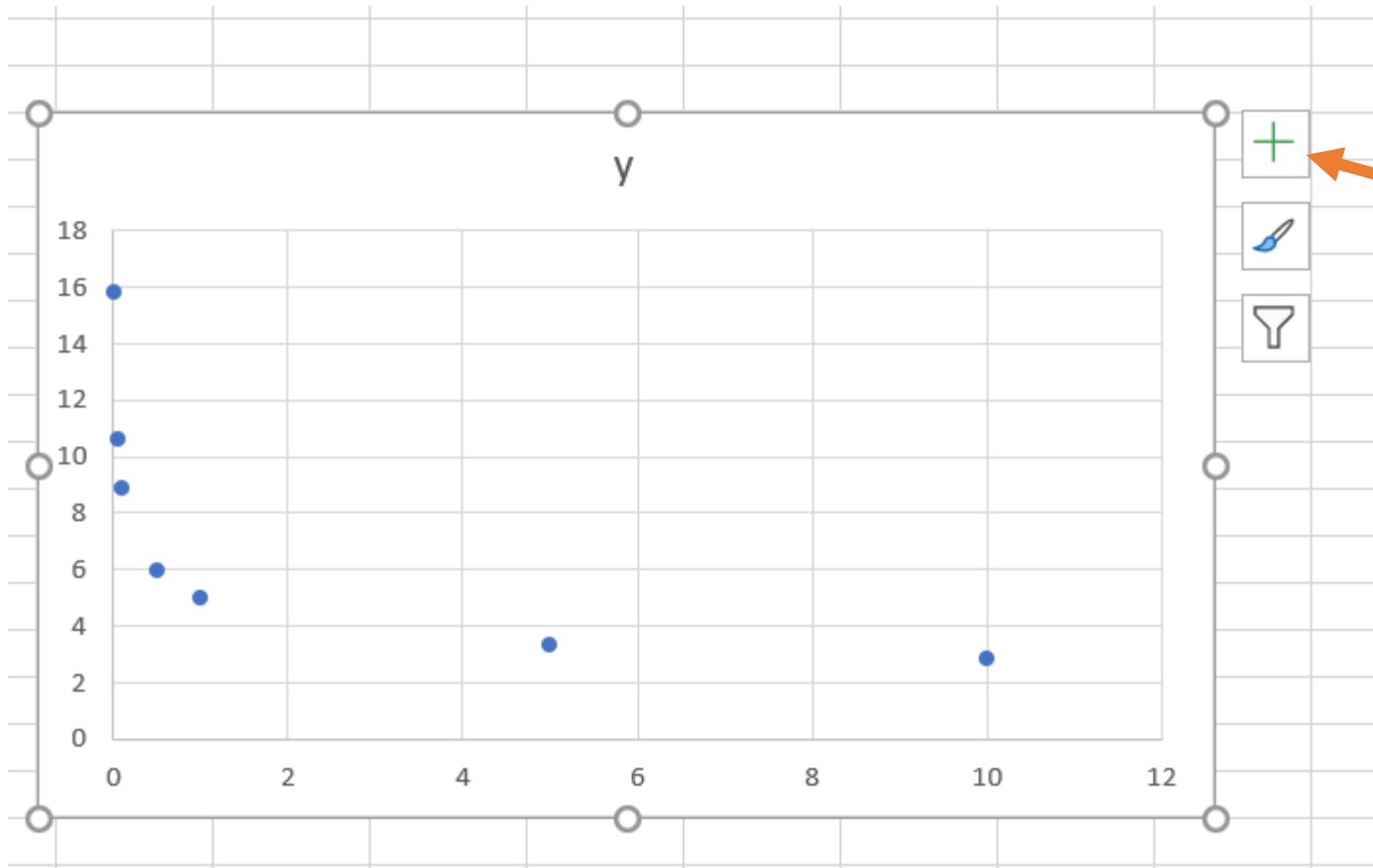
(i.e. Format chart)

Select the data then go insert and select scatter chart

| $y=5*x^{-0.25}$ | |
|-----------------|----------|
| x | y |
| 0.01 | 15.81139 |
| 0.05 | 10.57371 |
| 0.1 | 8.891397 |
| 0.5 | 5.946036 |
| 1 | 5 |
| 5 | 3.343702 |
| 10 | 2.811707 |



Use the plus sign to add
chart element



Add item to the
chart such as axes
title, chart title,
terndline etc

Chart Tools

Chart ribbon or chart tools
For chart modification

The screenshot displays the Microsoft Excel interface with the Chart Tools ribbon active. The ribbon includes sections for Chart Layouts, Chart Styles, Data, Type, and Location. A chart is plotted on a grid, showing a scatter plot with a power trendline. The data points are as follows:

| x | y |
|------|----------|
| 0.01 | 15.81139 |
| 0.05 | 10.57371 |
| 0.1 | 8.891397 |
| 0.5 | 5.946036 |
| 1 | 5 |
| 5 | 3.343702 |
| 10 | 2.811707 |

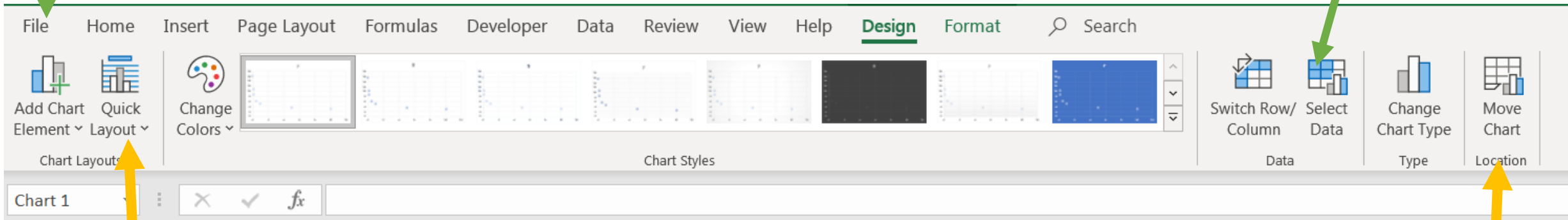
The chart includes a trendline with the equation $y = 5x^{-0.25}$ and $R^2 = 1$. The 'Format Chart Area' task pane is open on the right, showing options for Fill and Border. The 'Chart Elements' task pane is also visible, listing options such as Axes, Axis Titles, Chart Title, Data Labels, Error Bars, Gridlines, Legend, and Trendline.

Chart Tools

When you click on the chart you get this window on the top where you can add an item such as legend, trendline, , change the layout, change the type of the chart and do other things

Add an item

Select data
Add Data



Select a layout of the chart some of the layout include legend, x and y lables, etc

Move the chart

Add chart item or element



The screenshot shows the Microsoft Excel interface with the 'Add Chart Element' menu open. The menu items are:

- Axes
- Axis Titles
- Chart Title
- Data Labels
- Data Table
- Error Bars
- Gridlines
- Legend
- Lines
- Trendline
- Up/Down Bars

The chart on the worksheet is a scatter plot with a vertical axis labeled 'y'. The data points are:

| x | y |
|----|----------|
| 0 | 10 |
| 0 | 16 |
| 1 | 6 |
| 1 | 5 |
| 1 | 8.891397 |
| 1 | 10.57371 |
| 1 | 15.81139 |
| 5 | 3.343702 |
| 5 | 5.946036 |
| 10 | 2.811707 |

Select chart layout

The screenshot shows the Microsoft Excel interface with the 'Chart Tools' ribbon active. The 'Quick Layout' button is highlighted, and a dropdown menu is open, displaying various chart layout options. An orange arrow points to the 'Quick Layout' button. The worksheet contains a scatter plot with data points and a trendline. The data points are as follows:

| x | y |
|-----|----------|
| 0.1 | 8.891397 |
| 0.5 | 5.946036 |
| 1 | 5 |
| 5 | 3.343702 |
| 10 | 2.811707 |

The chart is a scatter plot with a trendline, showing a negative correlation between the x and y variables. The x-axis ranges from 0 to 12, and the y-axis ranges from 0 to 18. The data points are blue dots, and the trendline is a solid black line. The chart is titled 'y'.

Select data (Add and remove data)

The screenshot displays the Microsoft Excel interface with the 'Chart Tools' ribbon active. An orange arrow points to the 'Select Data' button in the 'Data' group. The 'Select Data Source' dialog box is open, showing the following details:

- Chart data range: `=Sheet1!B6:C13`
- Legend Entries (Series):
 - y
- Horizontal (Category) Axis Labels:
 - 0.01
 - 0.05
 - 0.1
 - 0.5
 - 1

The background shows a scatter plot with blue data points and a trendline equation $y=5*x^{0.25}$. The data points are as follows:

| x | y |
|------|----------|
| 0.01 | 15.81139 |
| 0.05 | 10.57371 |
| 0.1 | 8.891397 |
| 0.5 | 5.946036 |
| 1 | 5 |
| 5 | 3.343702 |
| 10 | 2.811707 |

Change chart type

The screenshot shows the Microsoft Excel interface with the 'Change Chart Type' dialog box open. The dialog is titled 'Change Chart Type' and has a 'Close' button in the top right corner. It features a 'Recommended Charts' section with 'All Charts' selected, and a list of chart types on the left. The 'XY (Scatter)' chart type is highlighted. A preview of the scatter plot is shown in the center of the dialog. The spreadsheet in the background contains a data table with columns 'x' and 'y' and a formula $y=5*x^{-0.25}$. The status bar at the bottom shows 'Ready' and the system tray with the date '8:14 AM 9/7/2021'.

| x | y |
|------|----------|
| 0.01 | 15.81139 |
| 0.05 | 10.57371 |
| 0.1 | 8.891397 |
| 0.5 | 5.946036 |
| 1 | 5 |
| 5 | 3.343702 |
| 10 | 2.811707 |

Move chart

You can make the chart in a separate sheet

The screenshot shows the Microsoft Excel interface with the 'Chart Tools' ribbon selected. The 'Move Chart' button in the 'Location' group is highlighted by an orange arrow. A 'Move Chart' dialog box is open, allowing the user to choose where to place the chart. The 'Object in:' dropdown is set to 'Sheet1'. The background shows a scatter plot with data points and a trendline. The data table is as follows:

| x | y |
|------|----------|
| 0.01 | 15.81139 |
| 0.05 | 10.57371 |
| 0.1 | 8.891397 |
| 0.5 | 5.946036 |
| 1 | 5 |
| 5 | 3.343702 |
| 10 | 2.811707 |

By double clicking on the chart you get format chart axes

The screenshot shows the Microsoft Excel interface with a scatter plot and a trendline. The data is as follows:

| x | y |
|------|----------|
| 0.01 | 15.81139 |
| 0.05 | 10.57371 |
| 0.1 | 8.891397 |
| 0.5 | 5.946036 |
| 1 | 5 |
| 5 | 3.343702 |
| 10 | 2.811707 |

The 'Format Chart Area' task pane is open on the right side of the chart, showing options for 'Chart Options' and 'Text Options'. The 'Format' tab is selected, and the 'Fill' and 'Border' sections are visible. A blue arrow points from the text 'Format chart area' to the task pane, and another blue arrow points from the text 'Format axes' to the chart's axes.

Format chart area

Format axes

Axes options

From format chart area select x axis and then click on this chart icon to go to axes options

The screenshot shows the Microsoft Excel interface with a scatter plot and a trendline. The data is as follows:

| x | y |
|------|----------|
| 0.01 | 15.81139 |
| 0.05 | 10.57371 |
| 0.1 | 8.891397 |
| 0.5 | 5.946036 |
| 1 | 5 |
| 5 | 3.343702 |
| 10 | 2.811707 |

The 'Format Axis' task pane is open on the right, showing the 'Axis Options' tab. An orange arrow points from the text on the right to the chart icon in the task pane.

Change axis scale

The screenshot shows the Microsoft Excel interface with a scatter plot of data points. The data is as follows:

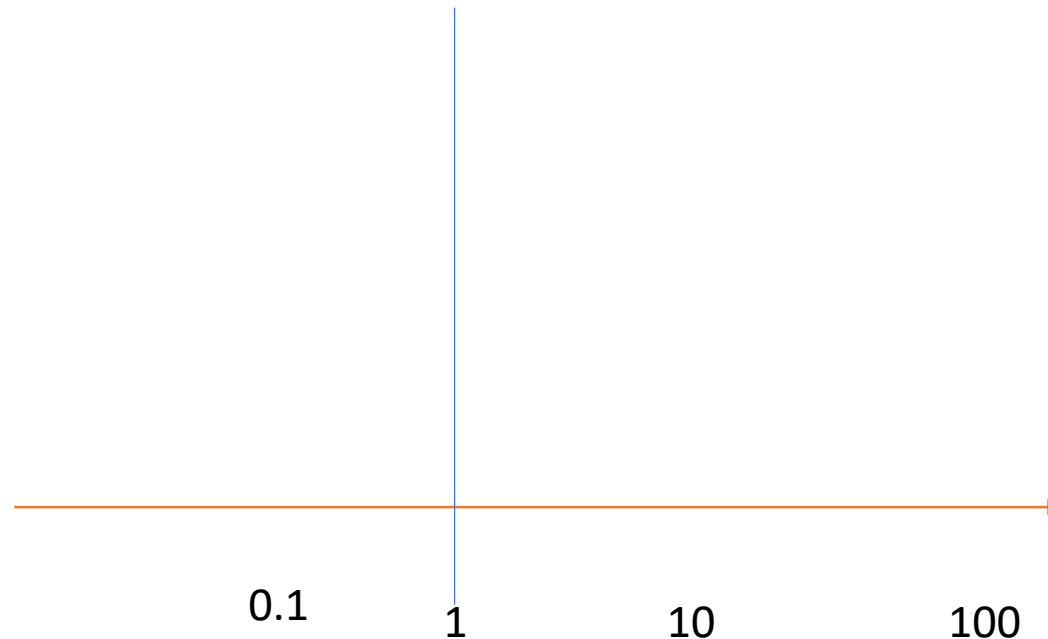
| x | y |
|------|----------|
| 0.01 | 15.81139 |
| 0.05 | 10.57371 |
| 0.1 | 8.891397 |
| 0.5 | 5.946036 |
| 1 | 5 |
| 5 | 3.343702 |
| 10 | 2.811707 |

The 'Format Axis' task pane is open, showing the 'Axis Options' section. The 'Logarithmic scale' checkbox is checked, and the 'Base' is set to 10. A blue arrow points from the text on the right to the 'Logarithmic scale' checkbox.

Through this axis option, the axis scale can be changed to logarithmic and how the x axis crosses the vertical axis.

Axes options

You can change where the vertical axis meets the x-axis and where the horizontal axis meets the vertical axis



Vertical axis

Horizontal axis

0.01 0.1 1 10 100

A-Vertical axis crosses horizontal axis at 1.0

Where the vertical axis meets the horizontal axis

Vertical axis

Horizontal axis

0.01 0.1 1 10 100

B-Vertical axis crosses horizontal axis at 0.01

Adding Trendline & equation curvefit

The screenshot shows the Microsoft Excel interface with the 'Format Trendline' task pane open. The chart displays a power trendline with the equation $y = 5x^{-0.25}$ and $R^2 = 1$. The data points are as follows:

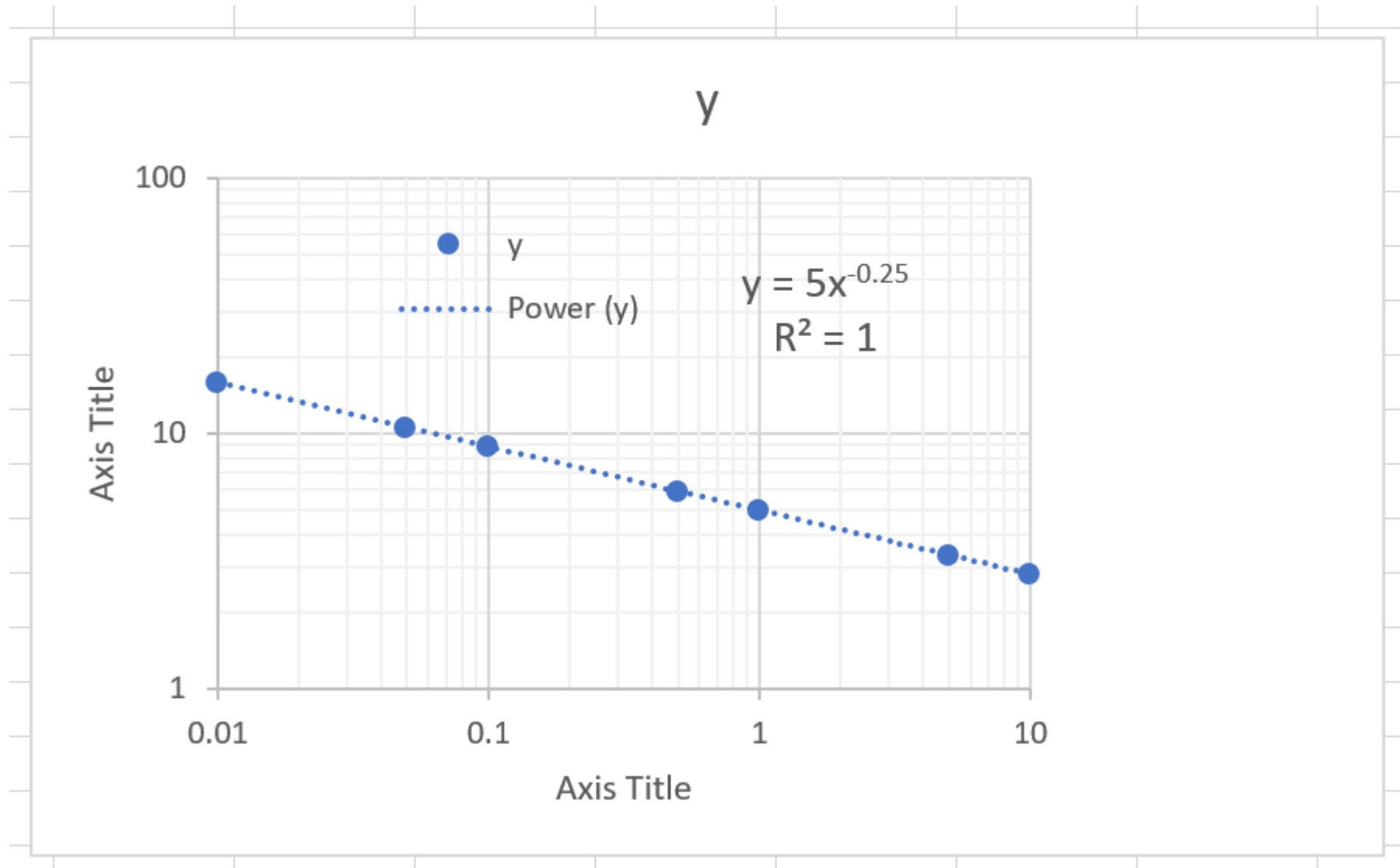
| x | y |
|------|----------|
| 0.01 | 15.81139 |
| 0.05 | 10.57371 |
| 0.1 | 8.891397 |
| 0.5 | 5.946036 |
| 1 | 5 |
| 5 | 3.343702 |
| 10 | 2.811707 |

The 'Format Trendline' task pane shows the following options:

- Trendline Options:** Exponential, Linear, Logarithmic, Polynomial (Order: 2), Power (selected), Moving Average (Period: 2).
- Trendline Name:** Automatic (selected), Custom (Power (y)).
- Forecast:** Forward (0.0 periods), Backward (0.0 periods), Set Intercept (0.0).
- Display Equation on chart:** Checked.

Different types of fit equations

Adding Trendline and curvfit equation



Conclusions

- 1-Excel chart plotting is very useful and strong in generating engineering plots
- 2-Curvefitting is easily done and can be shown on the chart along with the appropriate curvfit equation
- 3-The scale of the axes can be adjusted instantly
- 4-It is highly recommended to familiarized yourself in using Excel in general and in generating charts and formatting

