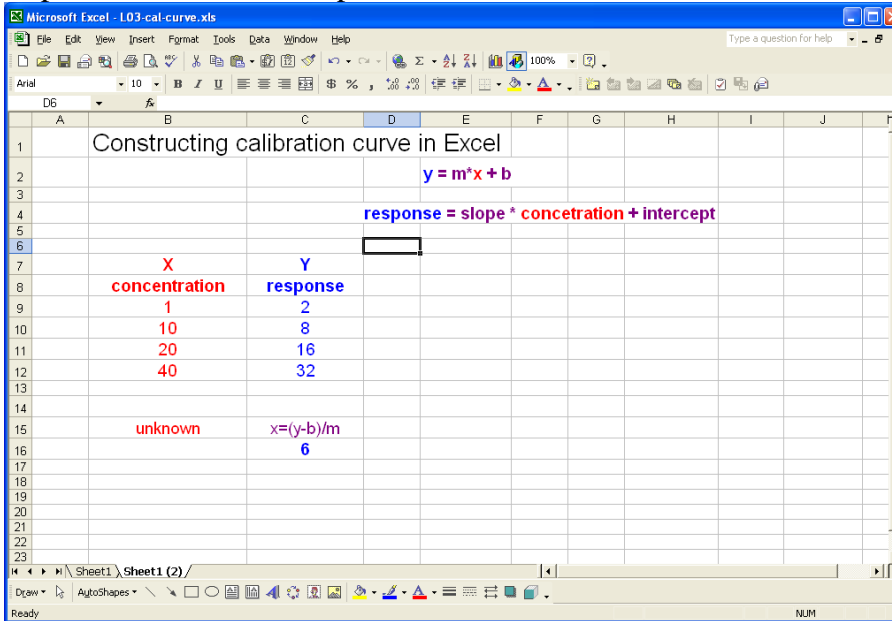


## Generating calibration curve in MS Excel

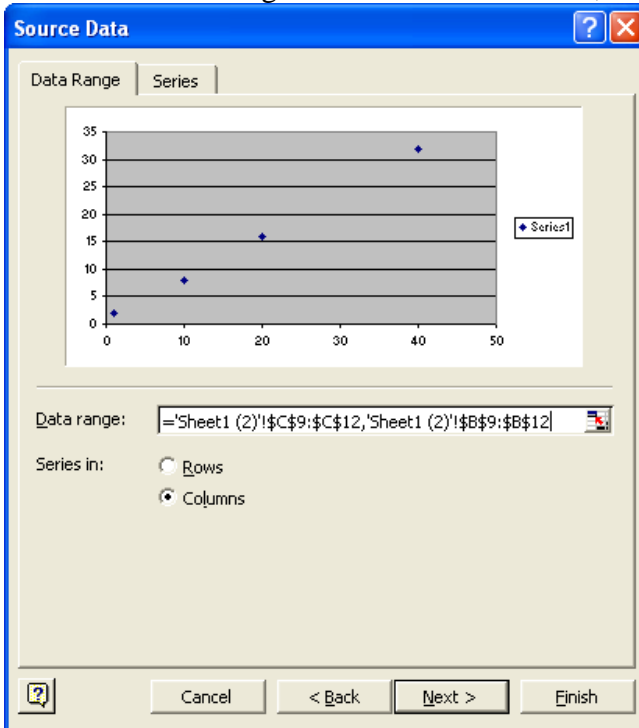
- 1) Graphical display will allow to check visually that all your data points are on the curve
- 2) Simple calculation of slope and intercept
- 3) Using function LINEST allows us to get also standard deviations and  $R^2$
- 4) Calculate unknown

Initial data consist of response (signal) of different concentrations of standard and response of unknown sample

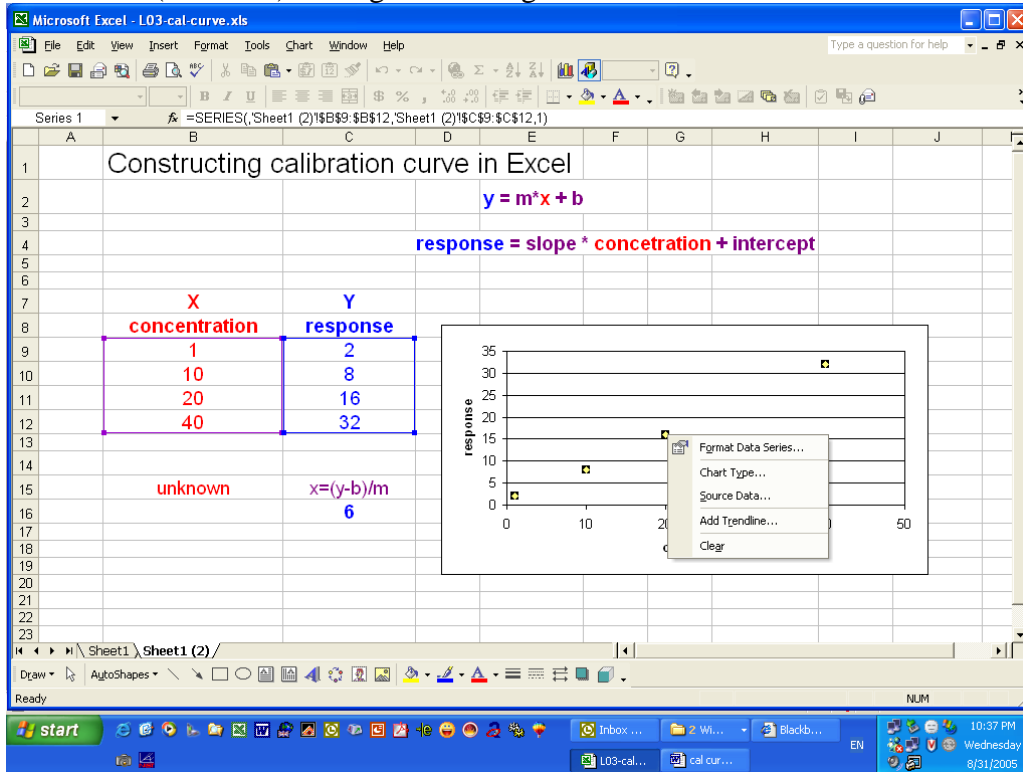


### 1) Graphical display

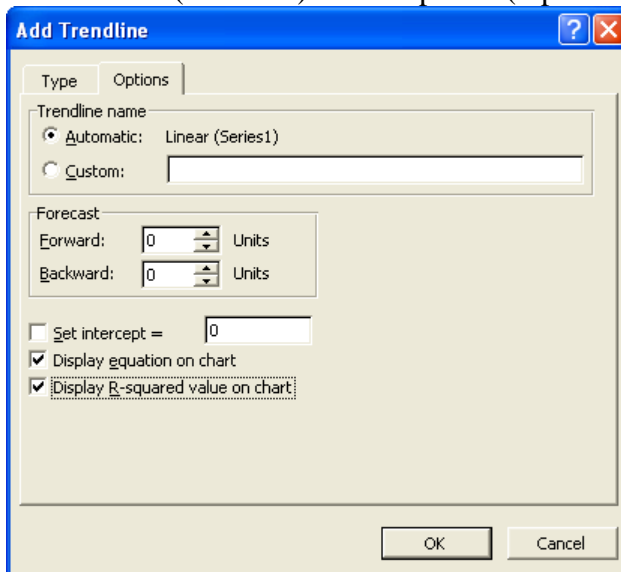
Use chart wizard to generate calibration curve, select "(XY) scatter"

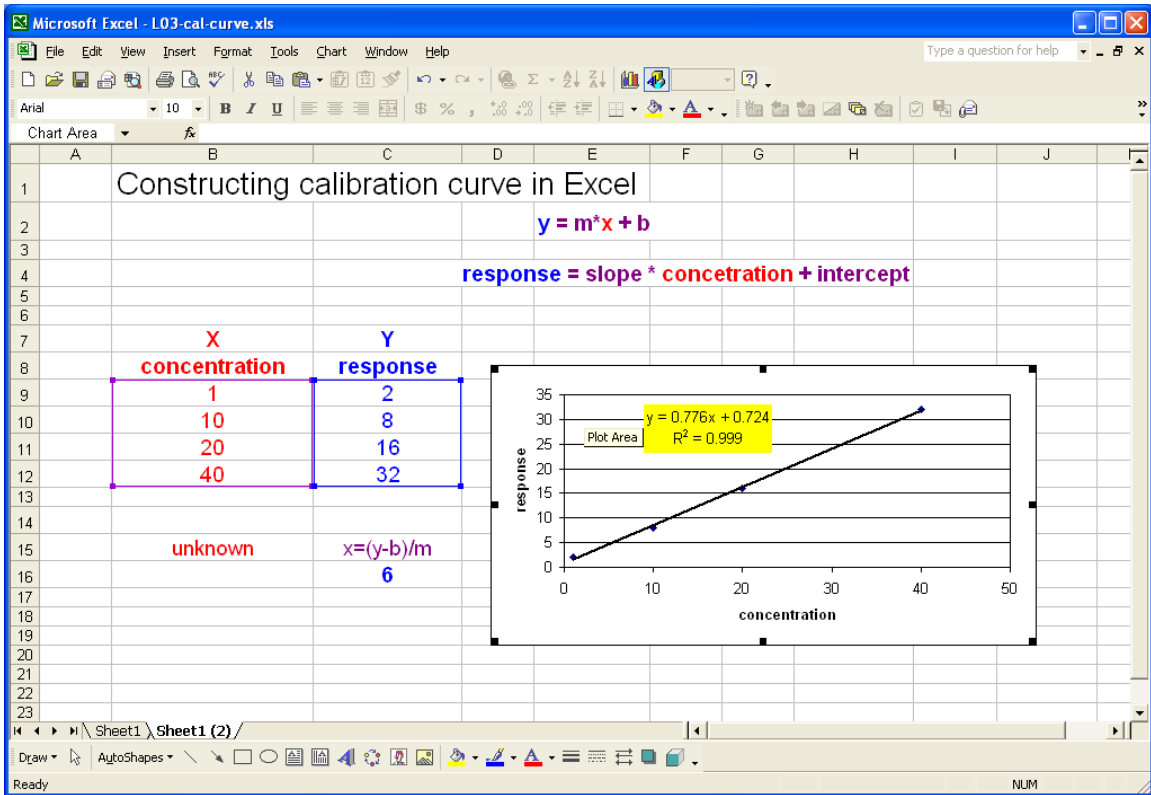


Select data (left click) and right click to get menu and select add trendline



Select linear (trendline) and in options (top menu) select “Display equation and R<sup>2</sup>”

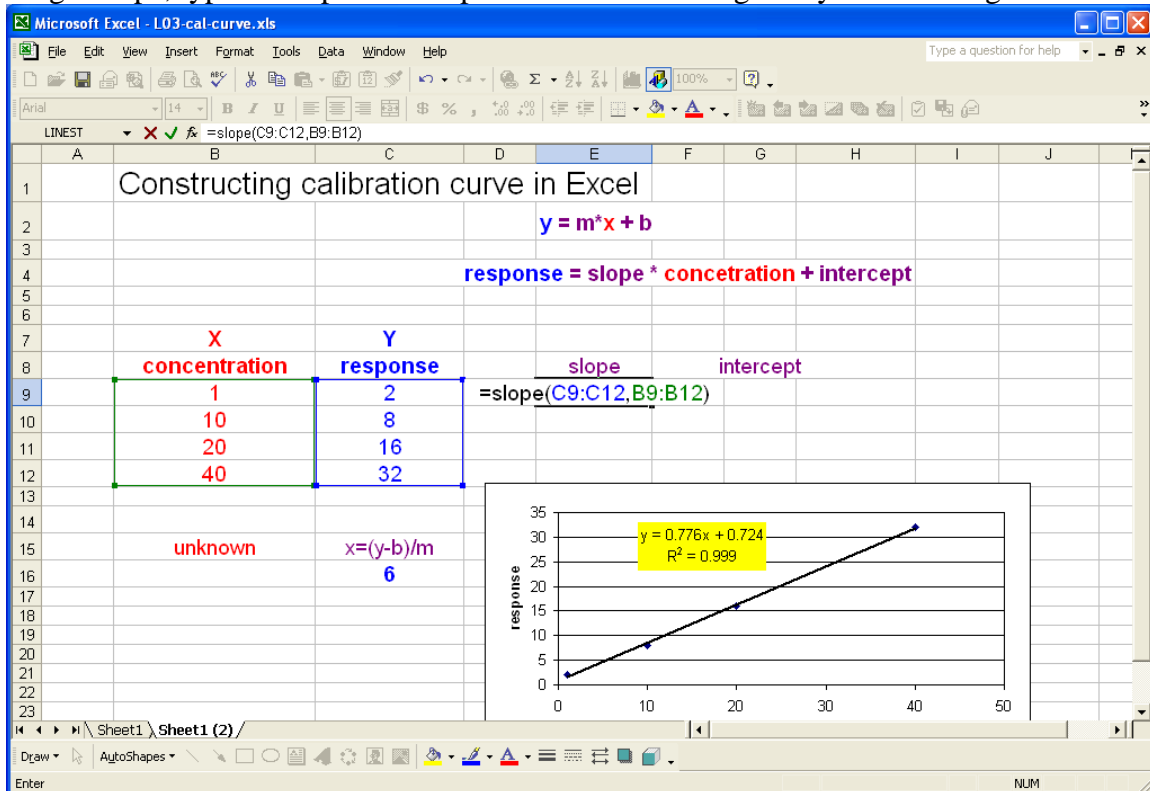




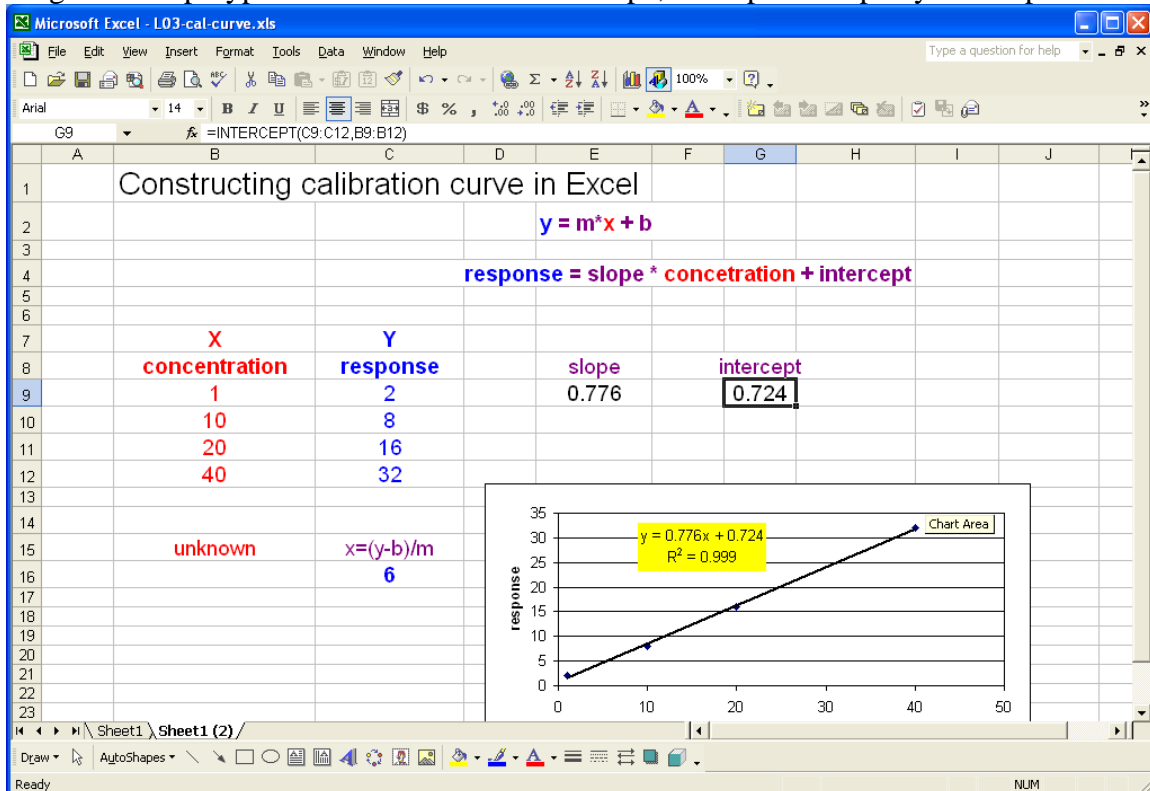
The result is the calibration curve, and equation.

## 2) Simple calculation of slope and intercept

To get slope, type “= slope” and in parenthesis select range for ys and xs ranges



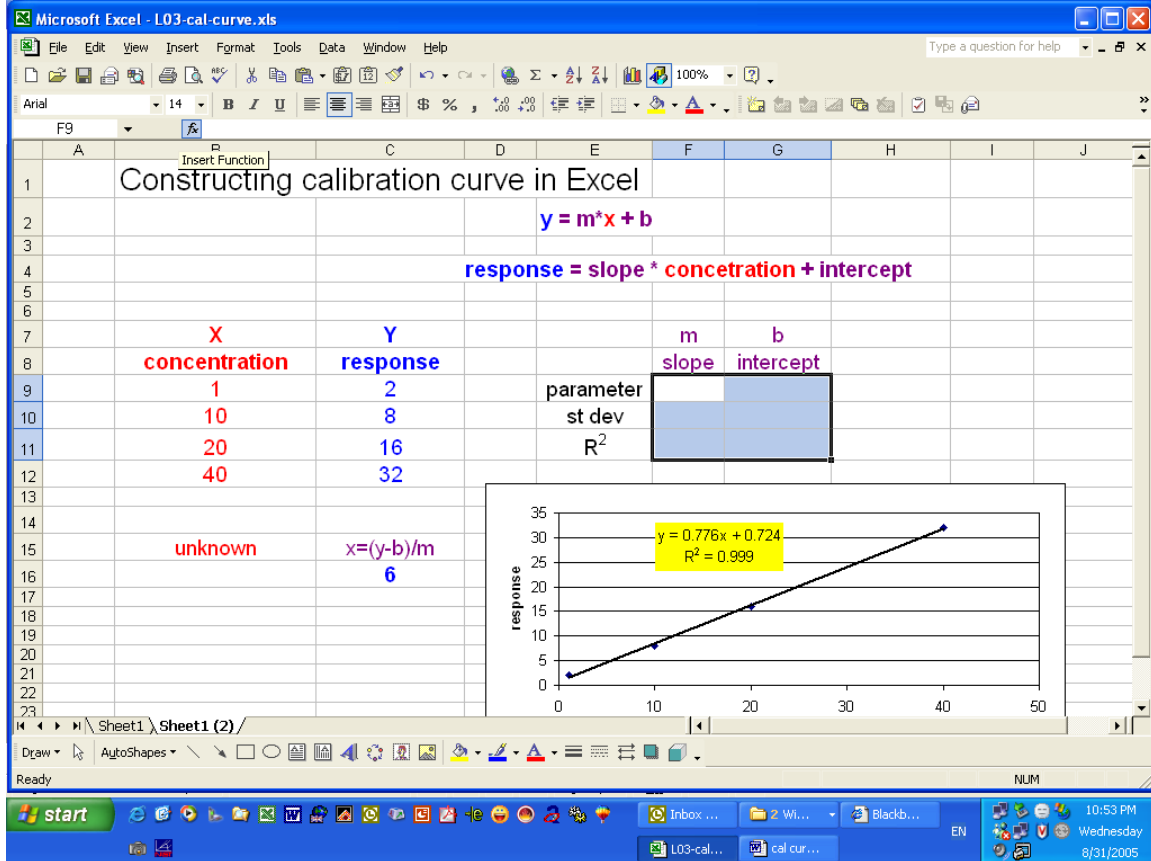
To get intercept type the same formula as for slope, but replace slope by intercept.



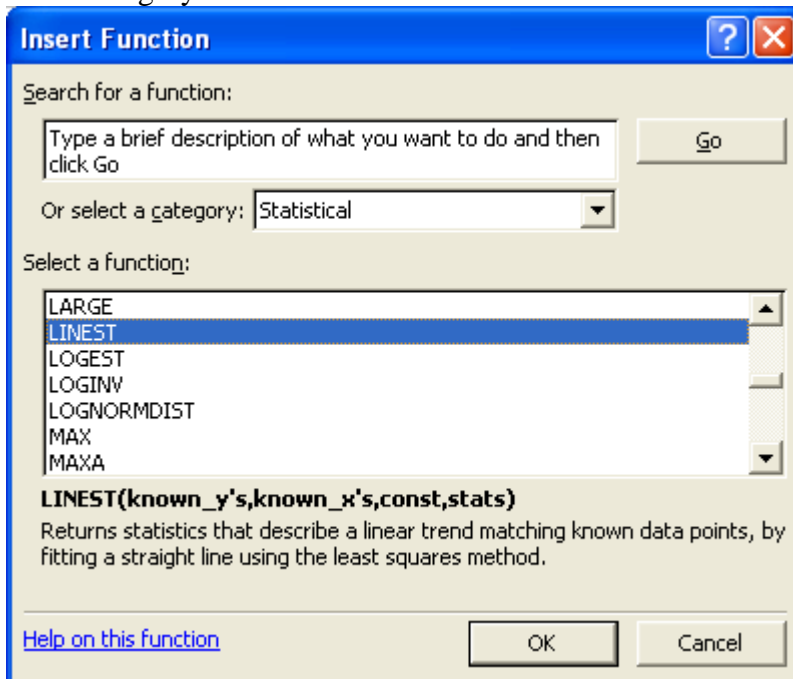
Note, the slope and intercept calculated are and should be the same as on the chart.

### 3) Using function LINEST allows us to get also standard deviations and $R^2$

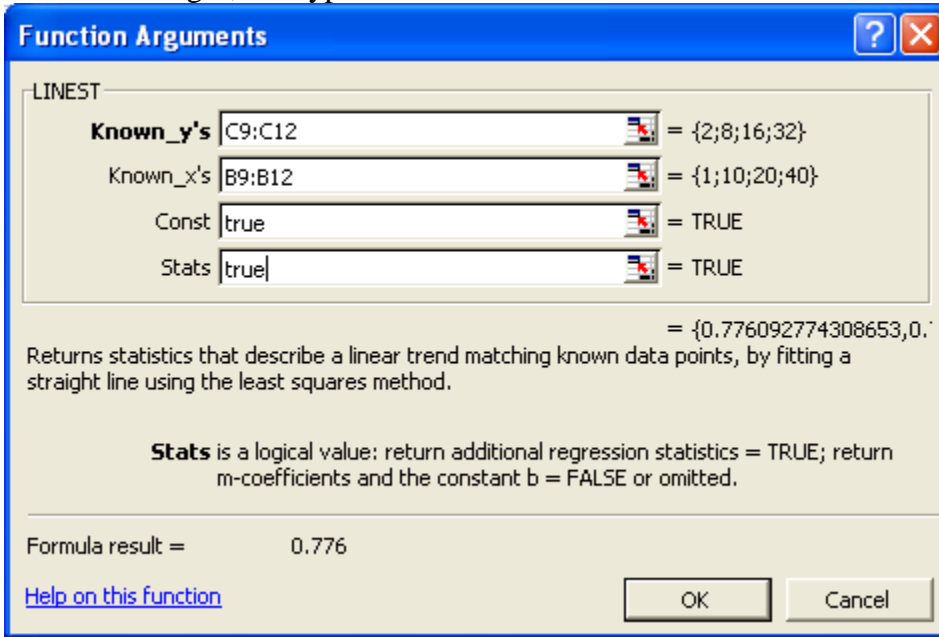
Select the area 2 x 3 cells and point at menu at insert function (above B column) and select



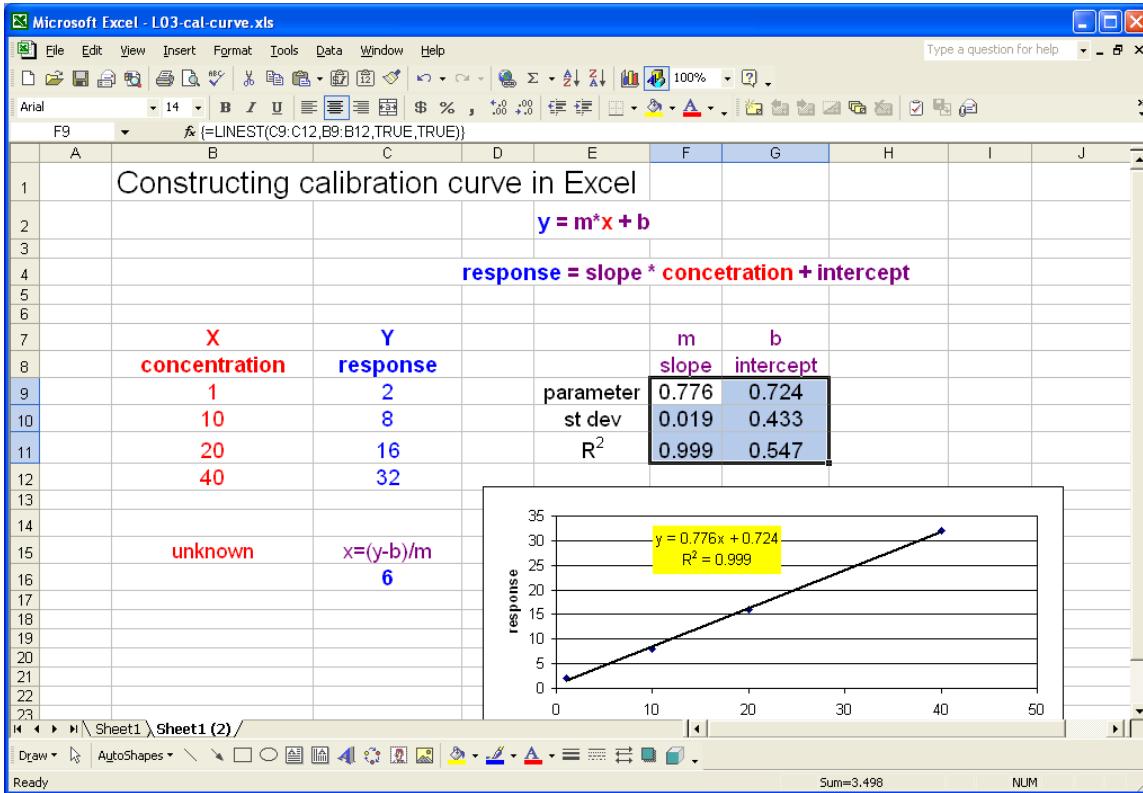
select category and function



select data ranges, and type in “true” for const and stats



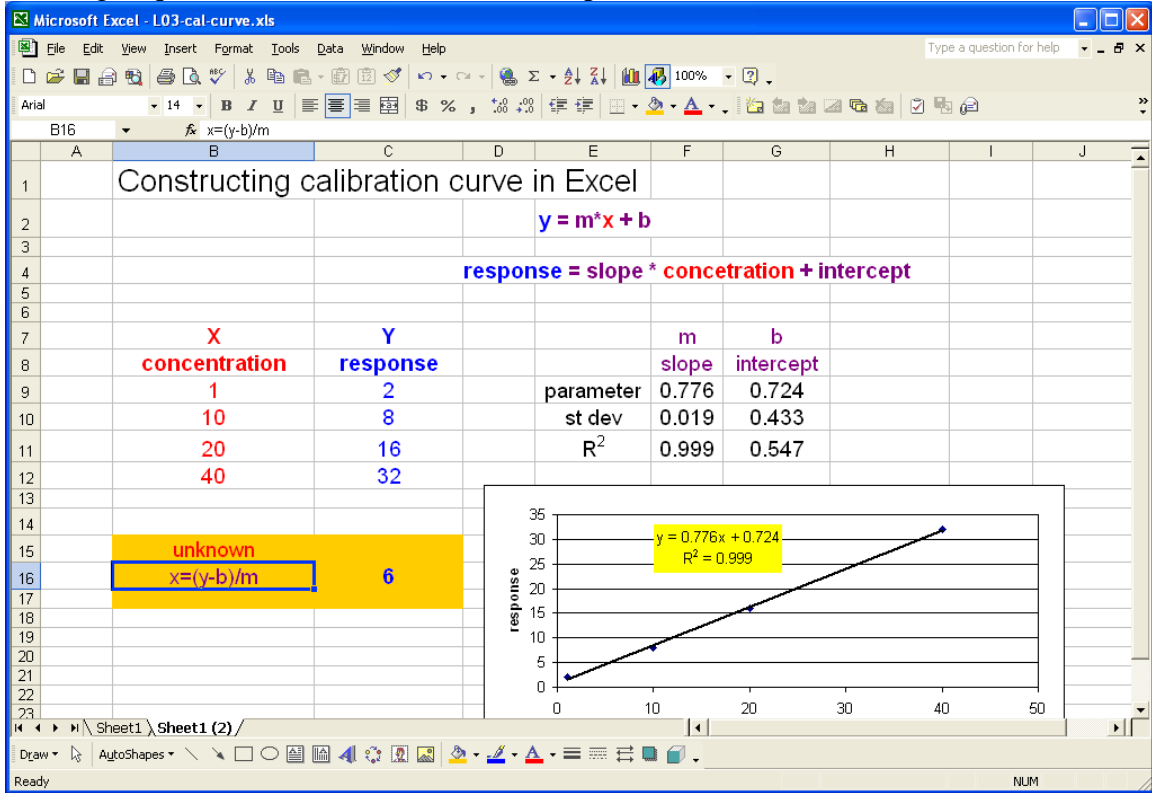
HIT **ctrl+shift+enter**



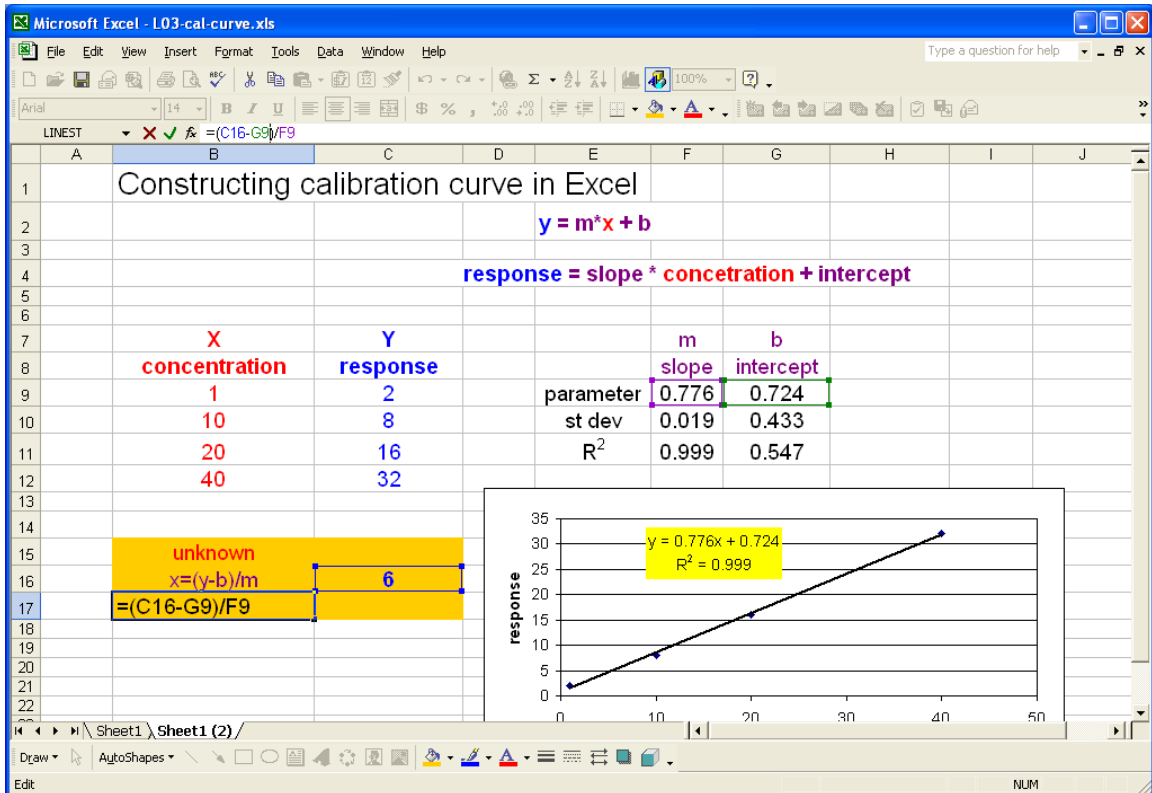
The values obtained in cells F9 – G11 are

|                   |                   |
|-------------------|-------------------|
| $m$ (slope)       | $b$ (y-intercept) |
| Std. Dev. for $m$ | Std. Dev for $b$  |
| $r^2$ (see below) | Std. Dev for $y$  |

- 4) calculate concentration of unknown  
 rearrange equation for calibration curve to express x ( concentration)



Based on the calibration we know slope (m) and intercept (b) and we measured response y.



The results would be 7, You should be able to get the same estimate from graphical display of calibration curve.

