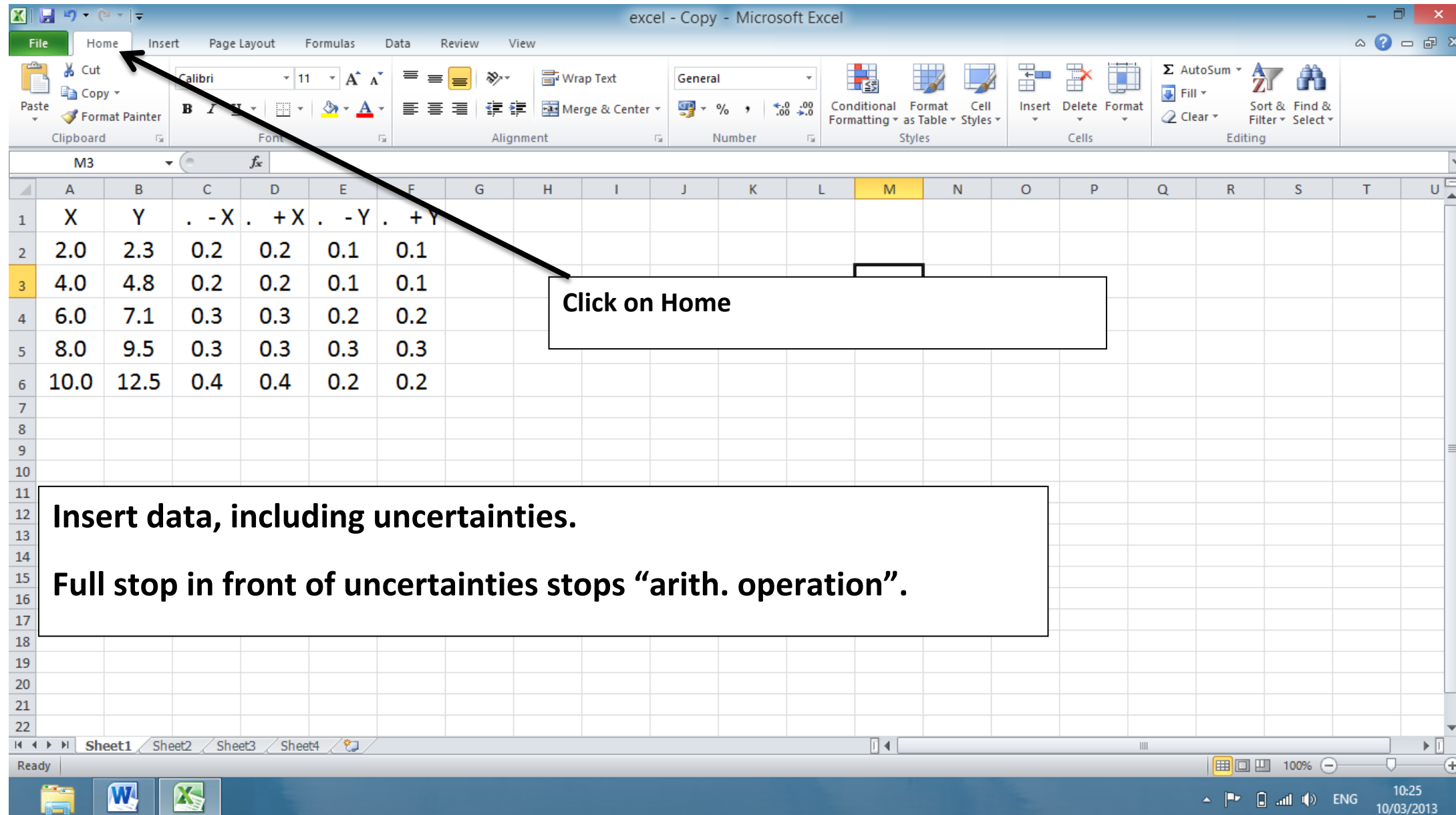


Use of Excel 2010 in AH Physics



The screenshot shows the Microsoft Excel 2010 interface. The 'Home' tab is selected in the ribbon. A black arrow points from the 'Home' tab to a text box that says 'Click on Home'. The spreadsheet contains data in columns A through F, rows 1 through 6. The data is as follows:

	A	B	C	D	E	F
1	X	Y	. -X	. +X	. -Y	. +Y
2	2.0	2.3	0.2	0.2	0.1	0.1
3	4.0	4.8	0.2	0.2	0.1	0.1
4	6.0	7.1	0.3	0.3	0.2	0.2
5	8.0	9.5	0.3	0.3	0.3	0.3
6	10.0	12.5	0.4	0.4	0.2	0.2

Below the spreadsheet, there is a text box with the following text:

Insert data, including uncertainties.
Full stop in front of uncertainties stops "arith. operation".

excel - Copy - Microsoft Excel

File Home Insert Page Layout Formulas Data Review View

PivotTable Table Picture Clip Art Shapes SmartArt Screenshot Column Line Pie Bar Area Scatter Other Charts Line Column Win/Loss Slicer Hyperlink Text Box Header & Footer WordArt Signature Line Object Equation Symbol

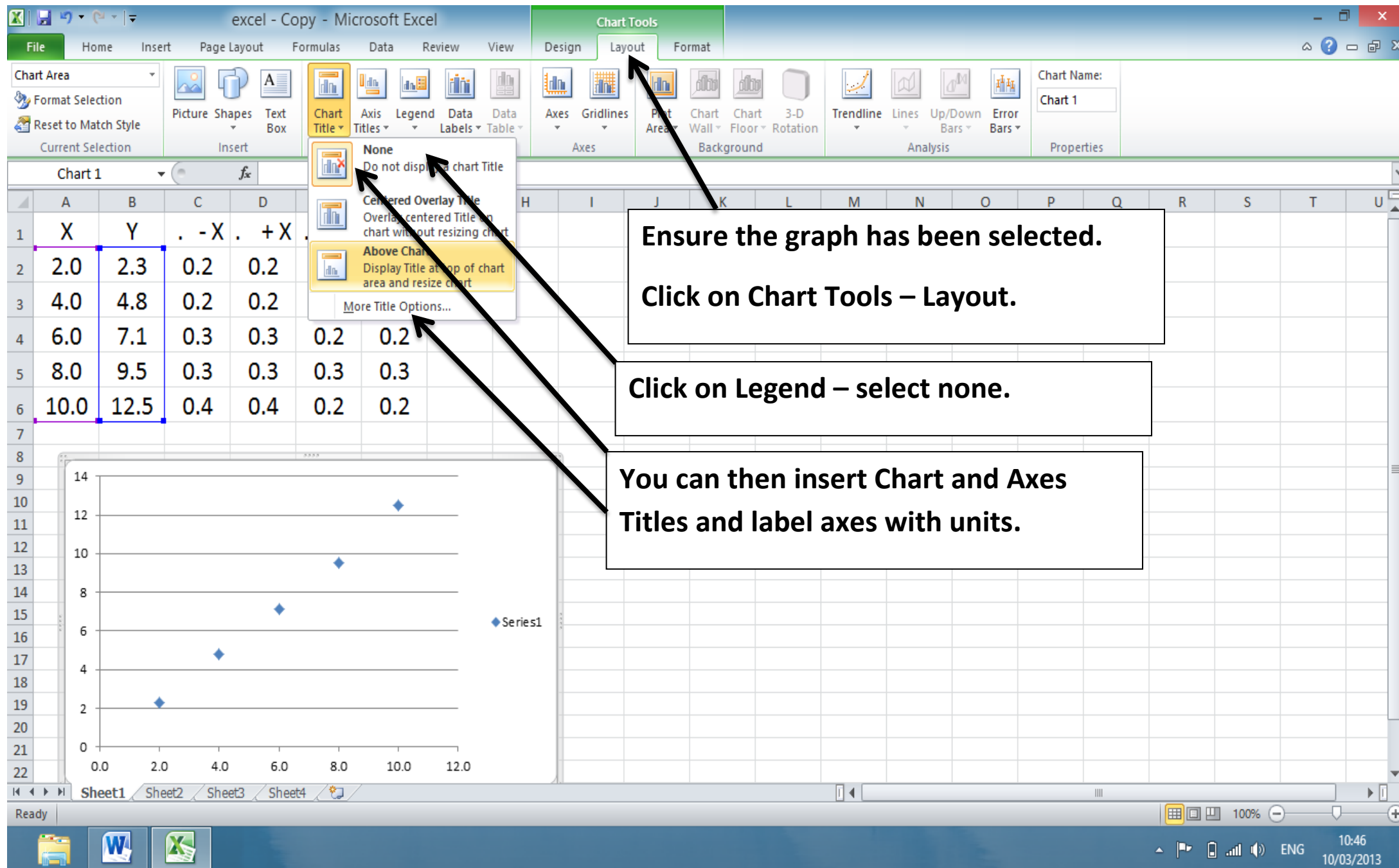
Tables Illustrations Charts Sparklines Filter Links Text Symbols

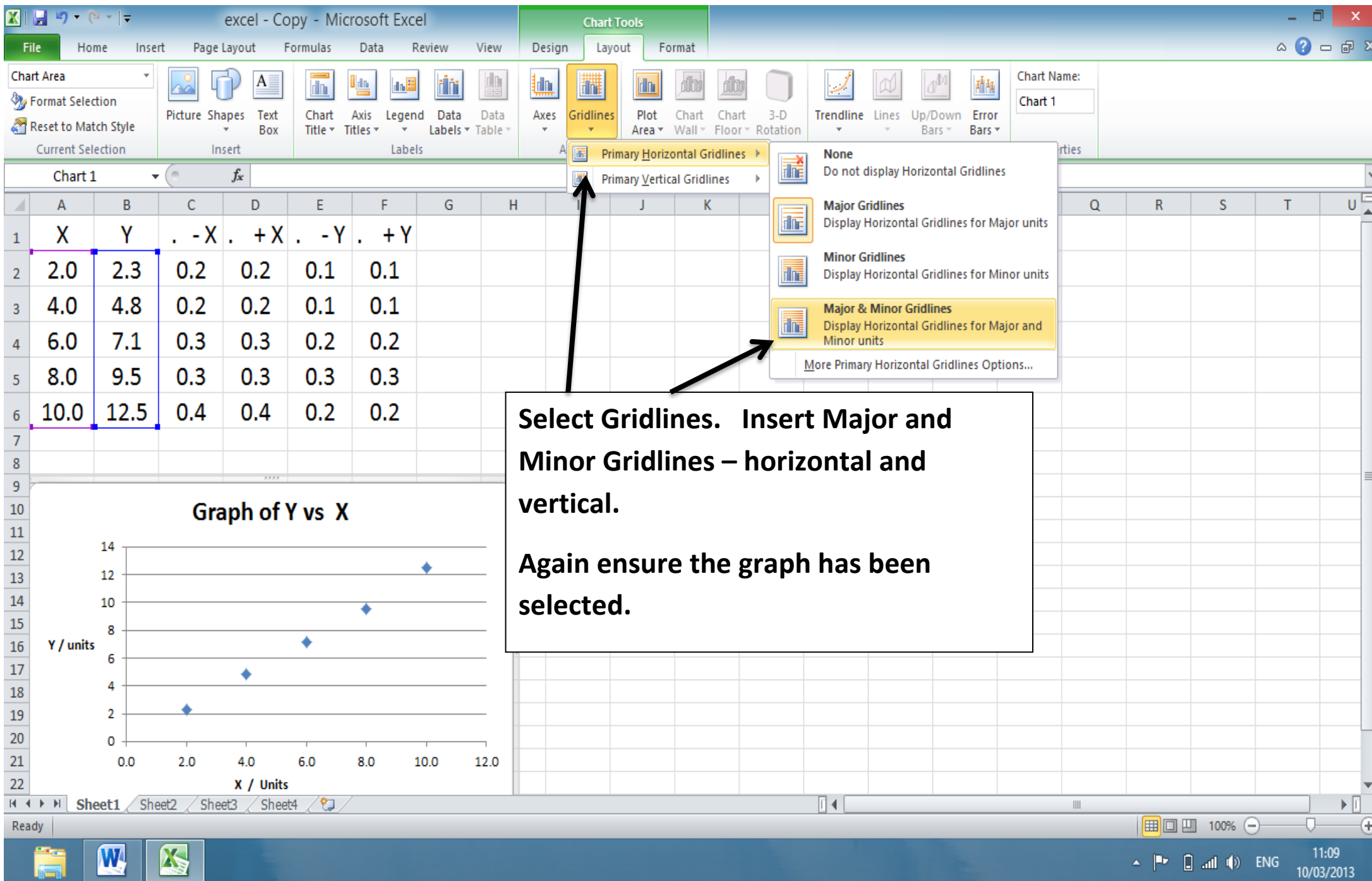
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	X	Y	. -X	. +X	. -Y	. +Y															
2	2.0	2.3	0.2	0.2	0.1	0.1															
3	4.0	4.8	0.2	0.2	0.1	0.1															
4	6.0	7.1	0.3	0.3	0.2	0.2															
5	8.0	9.5	0.3	0.3	0.3	0.3															
6	10.0	12.5	0.4	0.4	0.2	0.2															
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					
16																					
17																					
18																					
19																					
20																					
21																					
22																					

Scatter

All Chart Types...

Highlight data to be plotted.
Click on Insert, then select "Scatter"





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File Home Insert Page Layout Formulas Data Review View Design Layout Format

Chart Area

Format Selection

Reset to Match Style

Current Selection

Picture Shapes Text Box

Insert

Chart Title Axis Titles Legend Data Labels Data Table

Labels

Axes Gridlines Plot Area Chart Wall Chart Floor 3-D Rotation Background

Chart Name: Chart 1

Trendline

None
Removes the selected Trendline or all Trendlines if none are selected

Linear Trendline
Adds/sets a Linear Trendline for the selected chart series

Exponential Trendline
Adds/sets an Exponential Trendline for the selected chart series

Linear Forecast Trendline
Adds/sets a Linear Trendline with 2 period forecast for the selected chart series

Two Period Moving Average
Adds/sets a 2 Period Moving Average Trendline for the selected chart series

More Trendline Options...

Click on Trendline

Select "More Trendline Options".

Select "linear" if appropriate.

	A	B	C	D	E	F	G	H	I	J	K	L
1	X	Y	. -X	. +X	. -Y	. +Y						
2	2.0	2.3	0.2	0.2	0.1	0.1						
3	4.0	4.8	0.2	0.2	0.1	0.1						
4	6.0	7.1	0.3	0.3	0.2	0.2						
5	8.0	9.5	0.3	0.3	0.3	0.3						
6	10.0	12.5	0.4	0.4	0.2	0.2						

Graph of Y vs X

Y / units

X / Units

Sheet1 Sheet2 Sheet3 Sheet4

Ready

100%

11:16 10/03/2013

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File Home Insert Page Layout Formulas Data Review View Design Layout Format

Series 1 Trendline 1

Format Selection

Reset to Match Style

Current Selection

Picture Shapes Text Box

Insert

Chart Title Axis Titles Legend Data Labels Data Table

Labels

Axes Gridlines

Axes

Plot Area Chart Wall Chart Floor 3-D Rotation

Background

Trendline Lines Up/Down Bars Error Bars

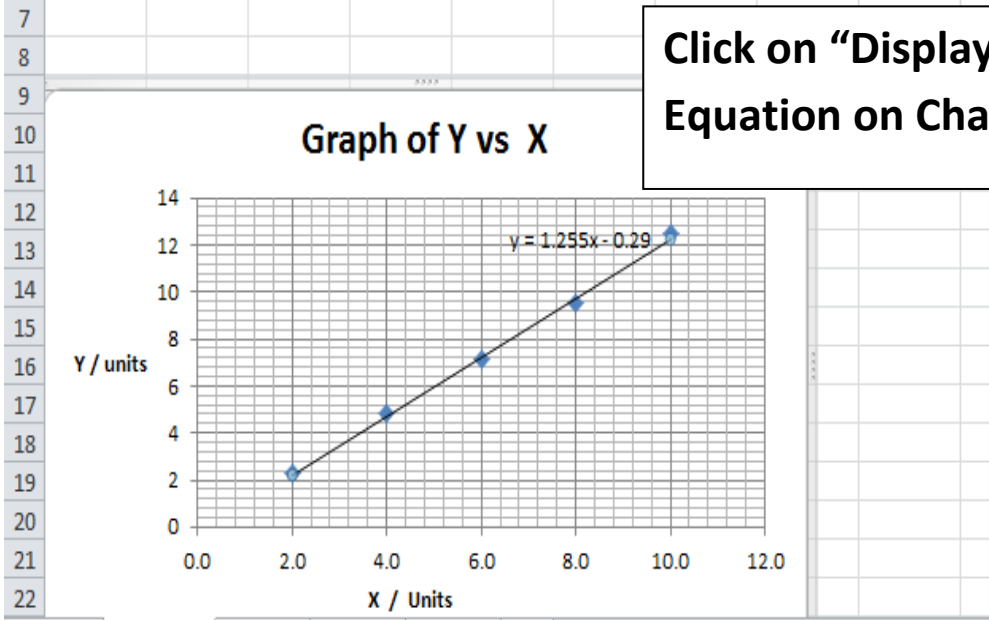
Analysis

Chart Name: Chart 1

Properties

Chart 1

	A	B	C	D	E	F	G	H	I
1	X	Y	. - X	. + X	. - Y	. + Y			
2	2.0	2.3	0.2	0.2	0.1	0.1			
3	4.0	4.8	0.2	0.2	0.1	0.1			
4	6.0	7.1	0.3	0.3	0.2	0.2			
5	8.0	9.5	0.3	0.3	0.3	0.3			
6	10.0	12.5	0.4	0.4	0.2	0.2			



Click on "Display Equation on Chart"

Format Trendline

Trendline Options

Line Color

Line Style

Shadow

Glow and Soft Edges

Trend/Regression Type

☐ Exponential

☒ Linear

☐ Logarithmic

☐ Polynomial Order: 2

☐ Power

☐ Moving Average Period: 2

Trendline Name

☒ Automatic: Linear (Series1)

☐ Custom:

Forecast

Forward: 0.0 periods

Backward: 0.0 periods

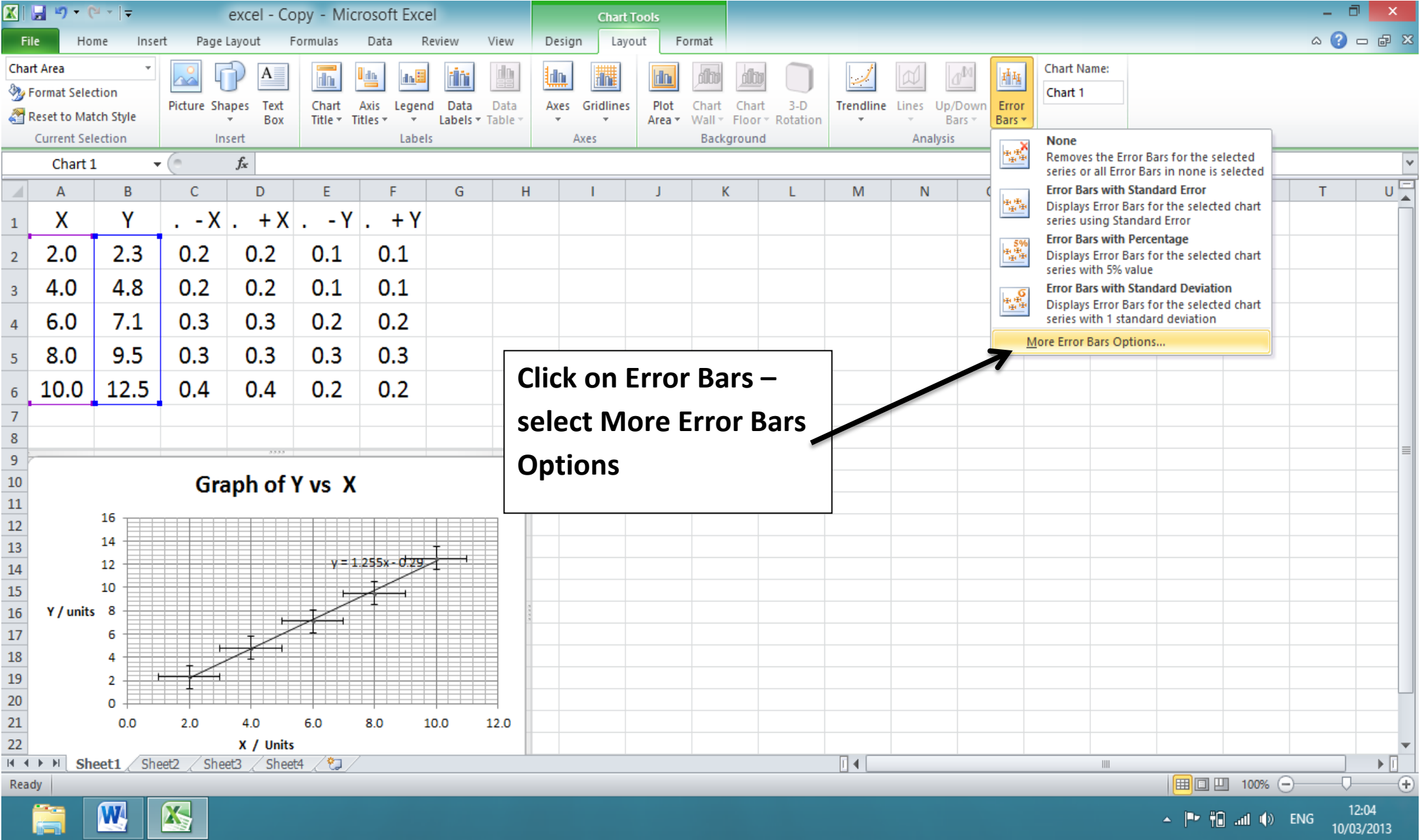
☐ Set Intercept = 0.0

☒ Display Equation on chart

☐ Display R-squared value on chart

Close

Custom Error Bars



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File Home Insert Page Layout Formulas Data Review View Design Layout Format

Series 1 Y Error Bars

Format Selection

Reset to Match Style

Current Selection

Picture Shapes Text Box

Insert

Chart Title Axis Titles Legend Data Labels Table

Labels

Axes Gridlines

Axes

Plot Area Chart Wall Chart Floor 3-D Rotation

Background

Trendline Lines Up/Down Bars Error Bars

Analysis

Chart Name: Chart 1

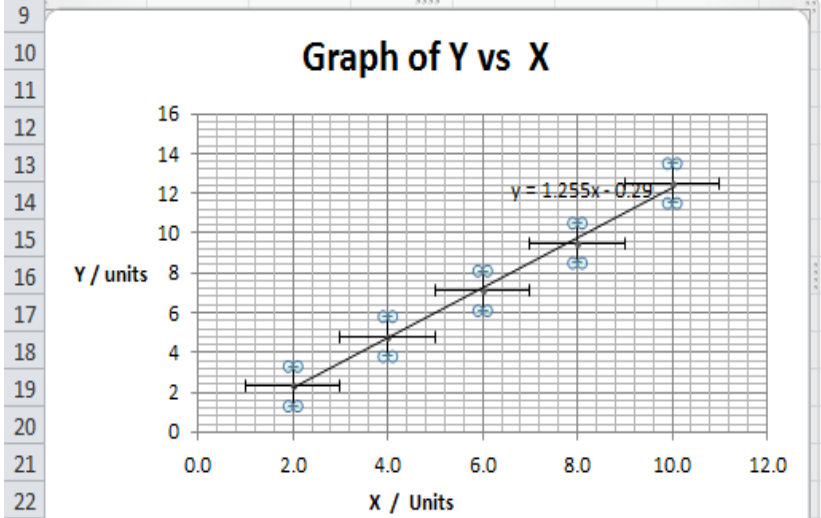
Properties

Chart 1

	A	B	C	D	E	F
1	X	Y	. -X	. +X	. -Y	. +Y
2	2.0	2.3	0.2	0.2	0.1	0.1
3	4.0	4.8	0.2	0.2	0.1	0.1
4	6.0	7.1	0.3	0.3	0.2	0.2
5	8.0	9.5	0.3	0.3	0.3	0.3
6	10.0	12.5	0.4	0.4	0.2	0.2

Select Both

Click on Custom and then Specify Value



Format Error Bars

Vertical Error Bars

Line Color

Line Style

Shadow

Glow and Soft Edges

Display

Direction

☒ Both

☐ Minus

☐ Plus

End Style

☐ No Cap

☒ Cap

Error Amount

☐ Fixed value: 0.1

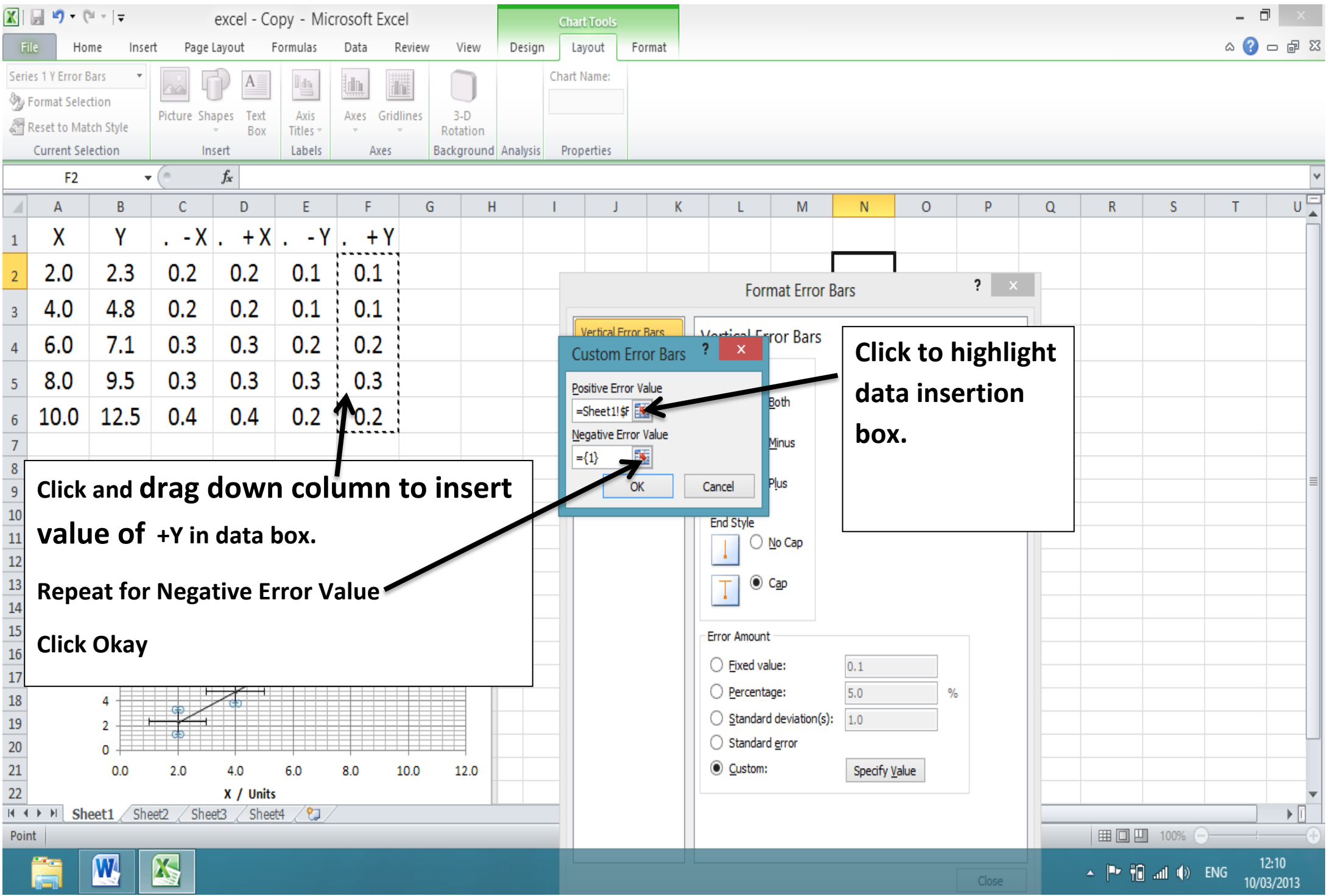
☐ Percentage: 5.0 %

☐ Standard deviation(s): 1.0

☐ Standard error

☒ Custom: Specify Value

Close



Current Selection

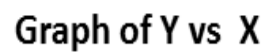


Properties

Chart 1 f_x

	A	B	C	D	E
1	X	Y	. - X	. + X	. - Y
2	2.0	2.3	0.2	0.2	0.1
3	4.0	4.8	0.2	0.2	0.1
4	6.0	7.1	0.3	0.3	0.2
5	8.0	9.5	0.3	0.3	0.3
6	10.0	12.5	0.4	0.4	0.2

To select horizontal error bars, click on any horizontal error bar on the graph.



Y / units

$$y = 1.255x - 0.0001$$

X / Units

Chart Area

Vertical Error Bars

Line Color

Line Style

Shadow

Glow and Soft Edges

Vertical Error Bars

Display

Direction



End Style



Error Amount

☐ Fixed value:

0,1

☐ Percentage:

5.0

%

☐ Standard deviation(s):

1.0

☐ Standard error

☒ Custom:

Specify Value

Sheet1

Sheet2

Sheet3

Sheet4

Ready

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File Home Insert Page Layout Formulas Data Review View Chart Tools Design Layout Format

Series 1 X Error Bars

Format Selection

Reset to Match Style

Current Selection

Picture Shapes Text Box

Insert

Chart Title Axis Titles Legend Data Labels Table

Labels

Axes Gridlines

Axes

Plot Area Chart Wall Floor Rotation

Background

Trendline Lines Up/Down Bars Error Bars

Analysis

Chart Name: Chart 1

Properties

Chart 1

Changes to Horizontal Error Bars

Graph of Y vs X

Y / units

X / Units

Sheet1 Sheet2 Sheet3 Sheet4

Ready

Format Error Bars

Horizontal Error Bars

Line Color

Line Style

Shadow

Glow and Soft Edges

Display

Direction

Both

Minus

Plus

End Style

No Cap

Cap

Error Amount

Fixed value: 1.0

Percentage: 5.0 %

Standard deviation(s): 1.0

Standard error

Custom: Specify Value

Close

100%

ENG

12:43

10/03/2013

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File Home Insert Page Layout Formulas Data Review View Design Layout Format

Series 1 X Error Bars

Format Selection

Reset to Match Style

Current Selection

Picture Shapes Text Box

Insert

Axis Titles Labels

Axes Gridlines

Axes

3-D Rotation Background Analysis Properties

Chart Name:

C2

f_x

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	X	Y	-X	+X	-Y																
2	2.0	2.3	0.2	0.2	0.1																
3	4.0	4.8	0.2	0.2	0.1																
4	6.0	7.1	0.3	0.3	0.2																
5	8.0	9.5	0.3	0.3	0.3																
6	10.0	12.5	0.4	0.4	0.2																
7																					
8																					
9																					
10																					
11																					
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15																					
16																					
17																					
18																					
19																					
20																					
21																					
22																					

Click, Drag down vertical column to insert data in box.

Click okay

Click to highlight data insertion box.

Graph of Y vs X

Y / units

X / Units

$y = 1.255x - 0.29$

Sheet1 Sheet2 Sheet3 Sheet4

Point

100%

12:48 10/03/2013

To change dot size / shape. (Use Format Data Series)

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File Home Insert Page Layout Formulas Data Review View Design Layout Format

Chart Tools

Chart Layouts Chart Styles

Chart 1 =SERIES(,Sheet1!\$A\$2:\$A\$6,Sheet1!\$B\$2:\$B\$6,1)

Doubleclick or right click just next to one of the points.

Format Data Series should open.

If you get Format Trendline or Format Error bar then you have clicked on the line. point or error bar.

Format Data Series

Series Options

Marker Options

Marker Type

☐ Automatic

☐ None

☒ Built-in

Type: [v]

Size: 2

Select Marker Options.

Built in.

Choose style and size

Close

Y / units

X / Units

$y = 1.255x - 0.29$

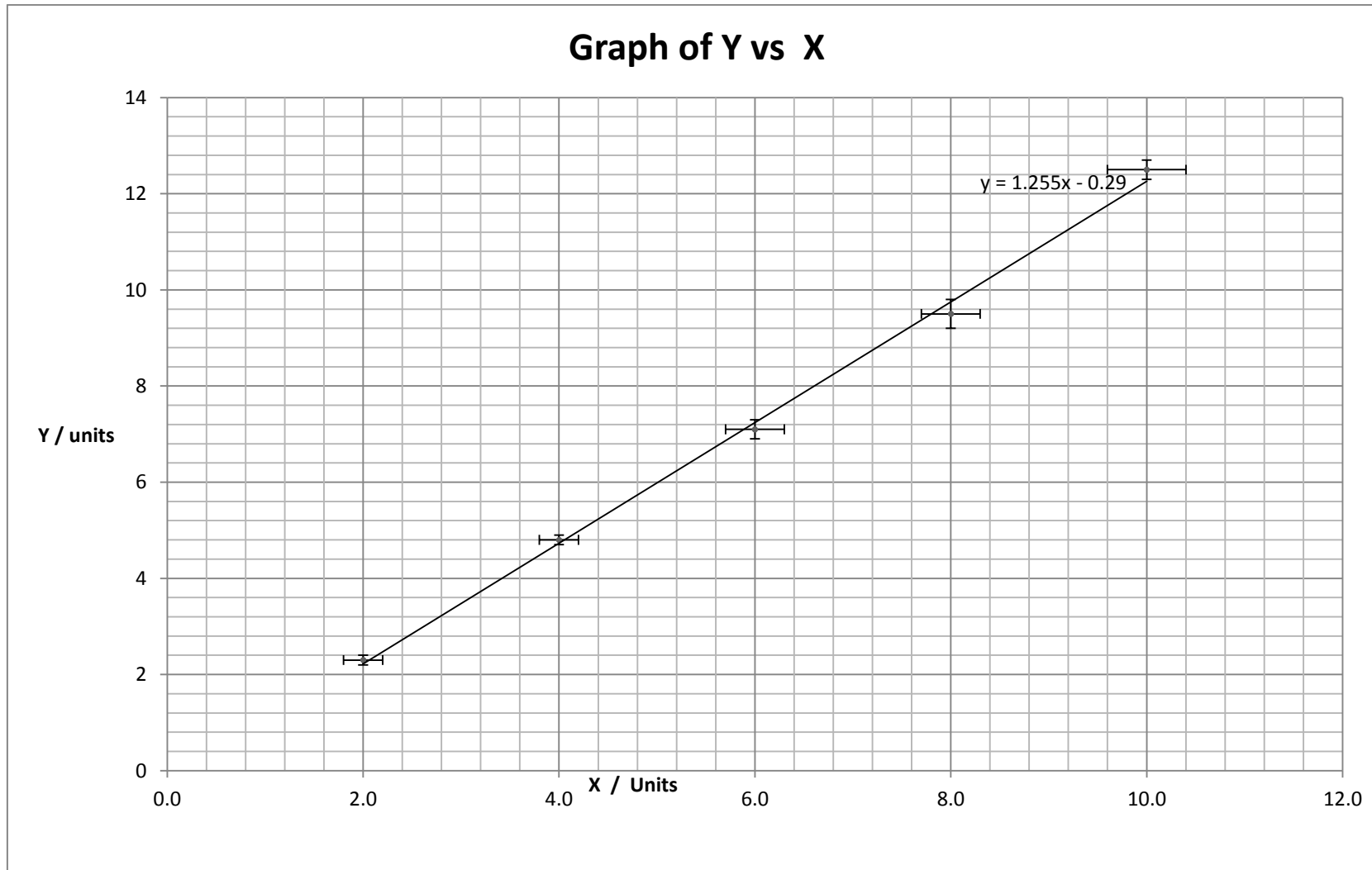
Sheet1 Sheet2 Sheet3 Sheet4

Ready

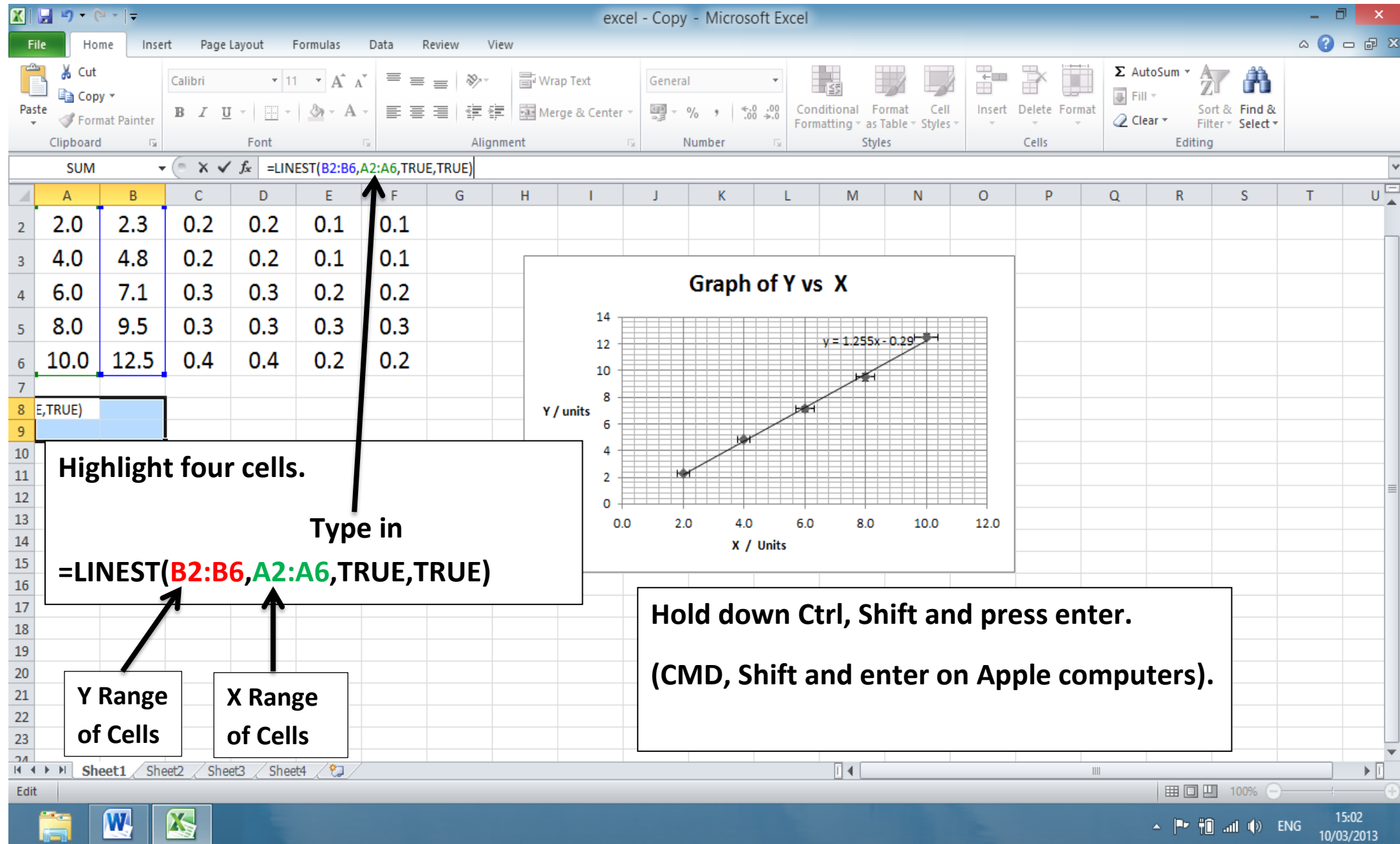
100%

16:01 10/03/2013

Increase the size of the graph to at least half a page.



Uncertainty in Gradient, Intercept - Use of Linest



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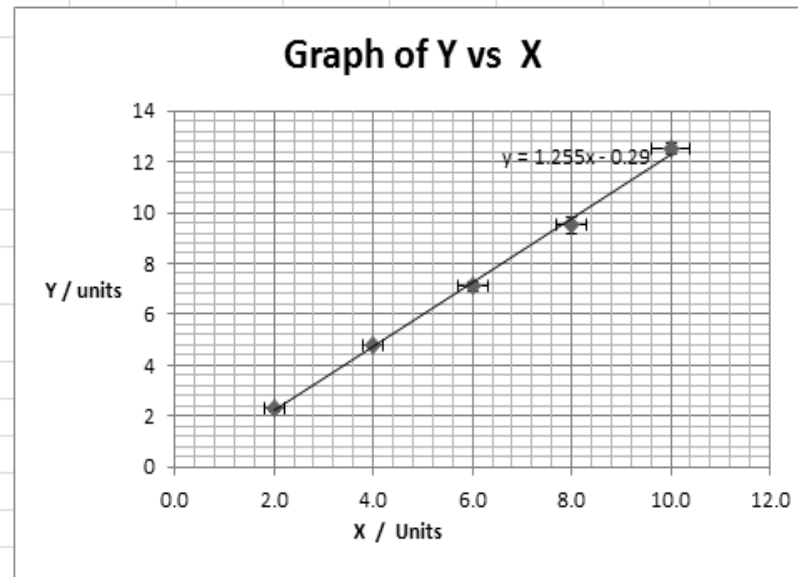
File Home Insert Page Layout Formulas Data Review View

Clipboard Font Alignment Number Styles Cells Editing

Calibri 18 B I U Wrap Text General Conditional Formatting as Table Cell Styles Insert Delete Format AutoSum Fill Clear Sort & Filter Find & Select

A8 {=LINEST(B2:B6,A2:A6,TRUE,TRUE)}

	A	B	C	D	E	F
2	2.0	2.3	0.2	0.2	0.1	0.1
3	4.0	4.8	0.2	0.2	0.1	0.1
4	6.0	7.1	0.3	0.3	0.2	0.2
5	8.0	9.5	0.3	0.3	0.3	0.3
6	10.0	12.5	0.4	0.4	0.2	0.2
8	1.255	-0.29				
9	0.035	0.2353				



Sheet1 Sheet2 Sheet3 Sheet4

Ready Average: 0.308943555 Count: 4 Sum: 1.23577422 100%

