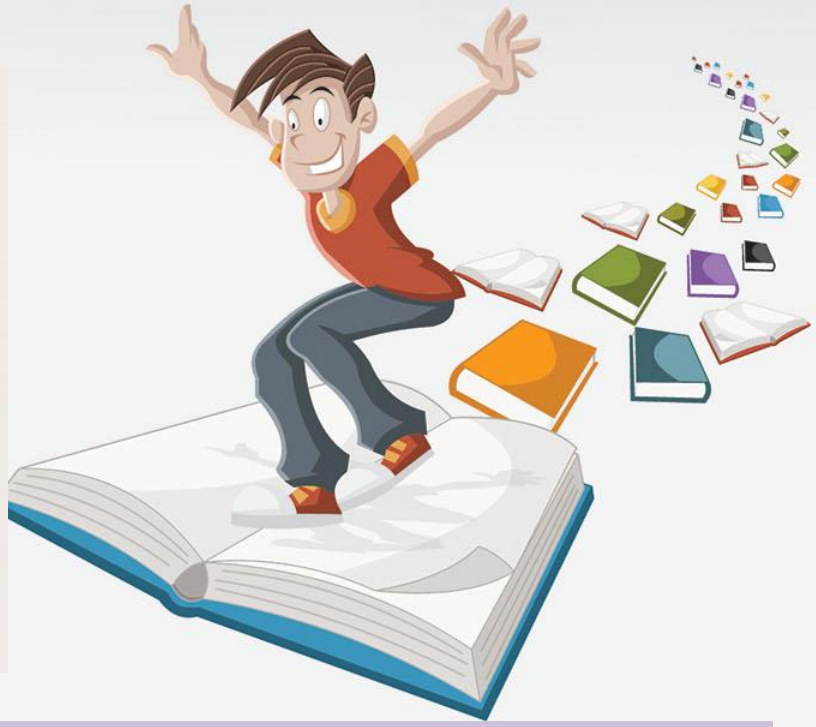


Biopharmaceutics
lab 6 part 2

In vitro dissolution study of per – oral tablet

Procedure (Dissolution study of nitrofurantoin tablets)

- Fill the jars with 1 L of dissolution fluid (artificial gastric juice)
- Put the jars in a thermostatically controlled water bath at 37 (switch water bath on)
- Place 1 tablet of nitrofurantoin in the basket of apparatus, and start the instrument immediately
- Set the speed on 50 r.p.m
- With draw 5 ml each 10 min for 1.5 hr

Notes

- stop apparatus for withdrawal.
- Substitute for the volume withdrawn each time interval using a fresh (artificial gastric juice) previously maintained at 37º C
- After withdrawal and replacement start instrument again
- Analyze samples of nitrofurantoin by reading the absorbance on a spectronic -20 at 369 nm ~370 nm immediately because nitrofurantoin solution discolored by exposure to light
- Use the following stright line equation to obtain the concentartion of y= c+bx , y= AB, X= conc.(mg/100ml), c=0.01, b=0.4

Collection time (min)	Ab	Conc.(mg/ml)	Percent drug release
10			
20			
30			
40			
50			
60			
75			
90			

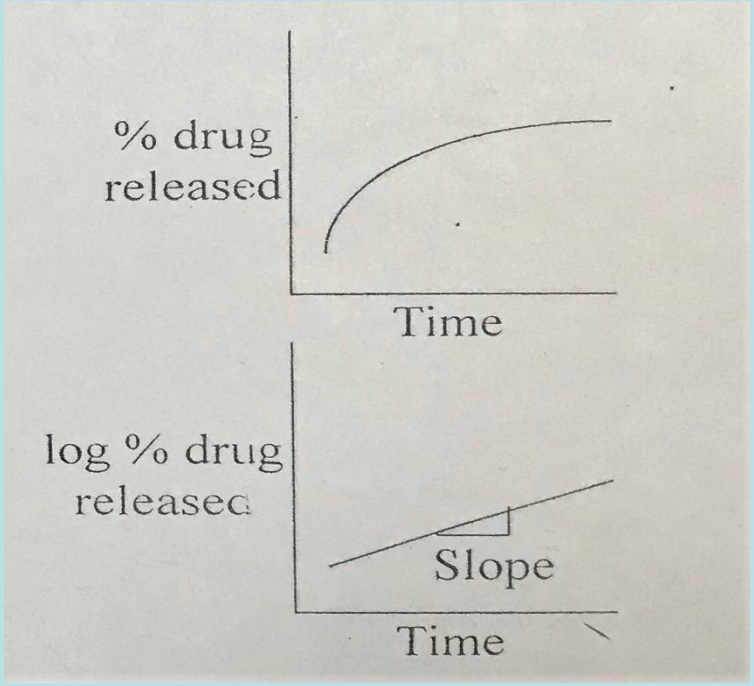
- To obtain percent drug release:
- Con.(mg/ml)X vol. of dissolution media =mg amount of drug released into the dissolution media
- % of drug released = amount of drug release /amount of drug in the tablet *100
- Plot the following graphs :
- 1. drug release % versus time in (min)
- 2. log % drug released versus time in (min)
- Find dissolution rate K from

the slope

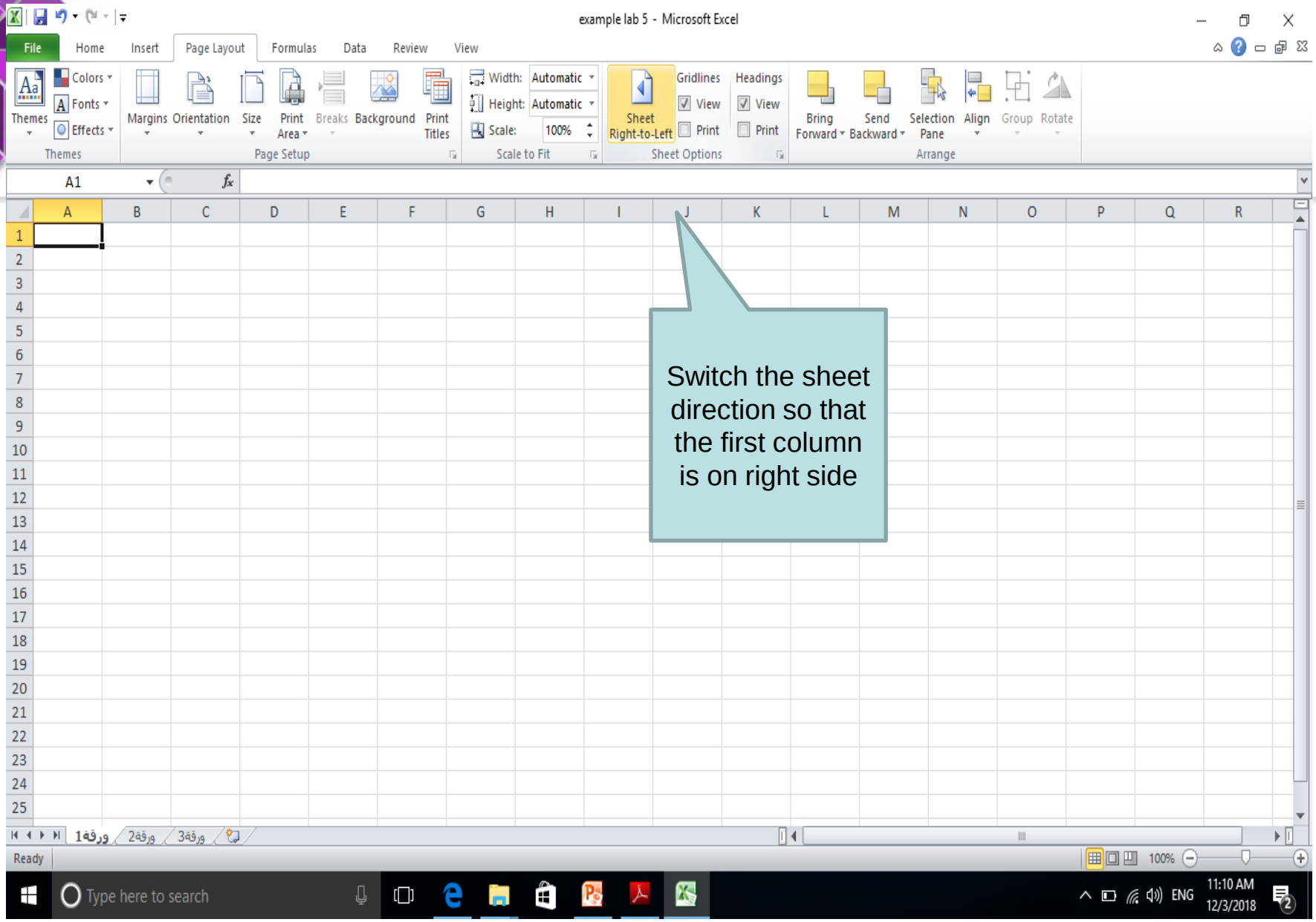
K= slope * 2.303

- Note : amount of drug is

equal to 100 mg in each tab



WORKING EXAMPLE USING EXCEL SHEET


example lab 5 - Microsoft Excel
File
Home
Insert
Page Layout
Formulas
Data
Review
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Themes
Colors
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Effects
Margins
Orientation
Size
Print Area
Breaks
Background
Print Titles
Page Setup
Width: Automatic
Height: Automatic
Scale: 100%
Scale to Fit
Sheet Right-to-Left
Gridlines
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Headings
View
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Sheet Options
Bring Forward
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Align
Group
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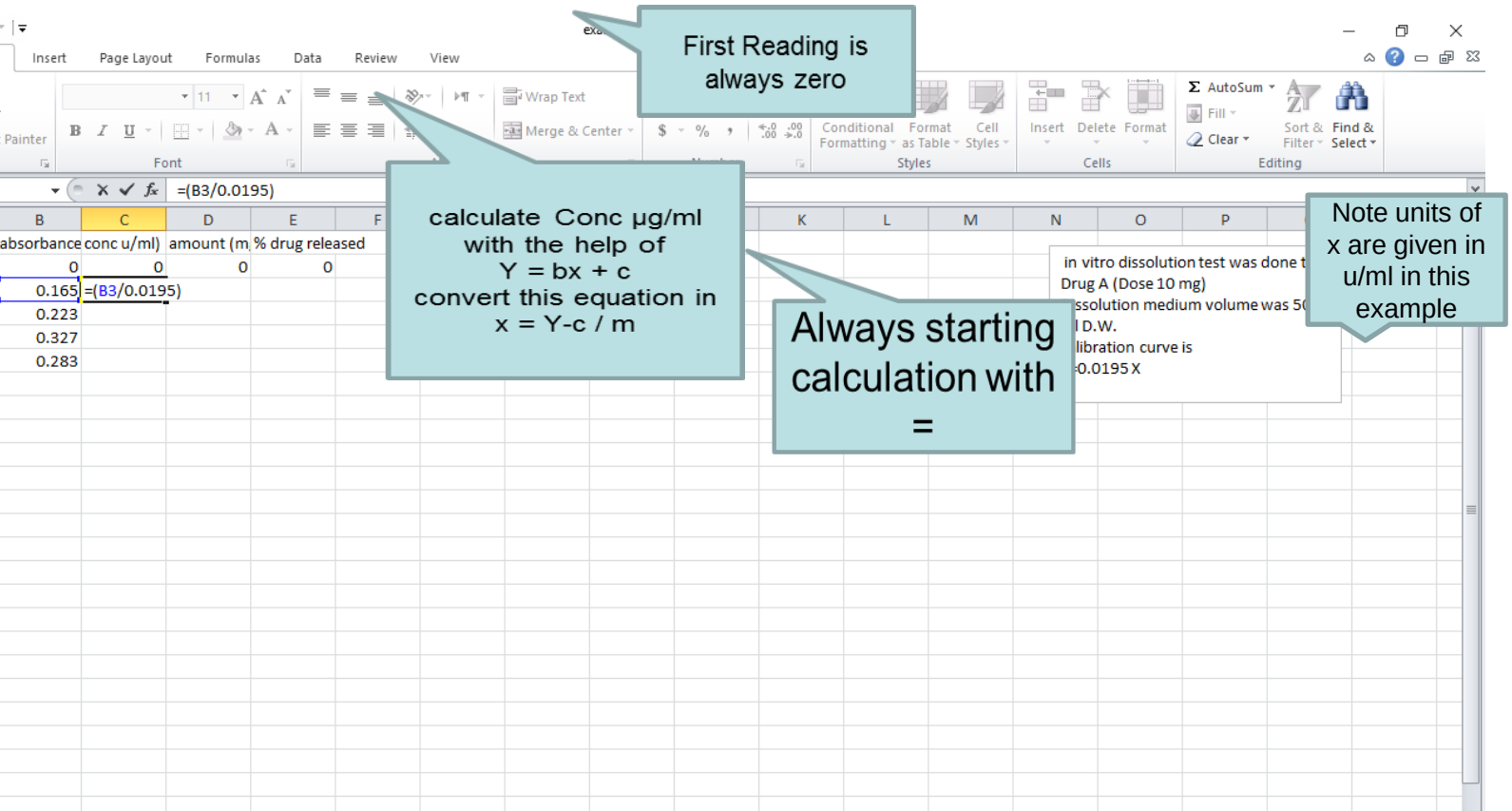
A1
Switch the sheet direction so that the first column is on right side
ورقة1
ورقة2
ورقة3
Ready
100%
Type here to search
ENG
11:10 AM
12/3/2018


First Reading is always zero
calculate Conc µg/ml with the help of Y = bx + c convert this equation in x = Y-c / m
Always starting calculation with =
Note units of x are given in u/ml in this example
Insert
Page Layout
Formulas
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Wrap Text
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Conditional Formatting
Format as Table
Cell Styles
Insert
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AutoSum
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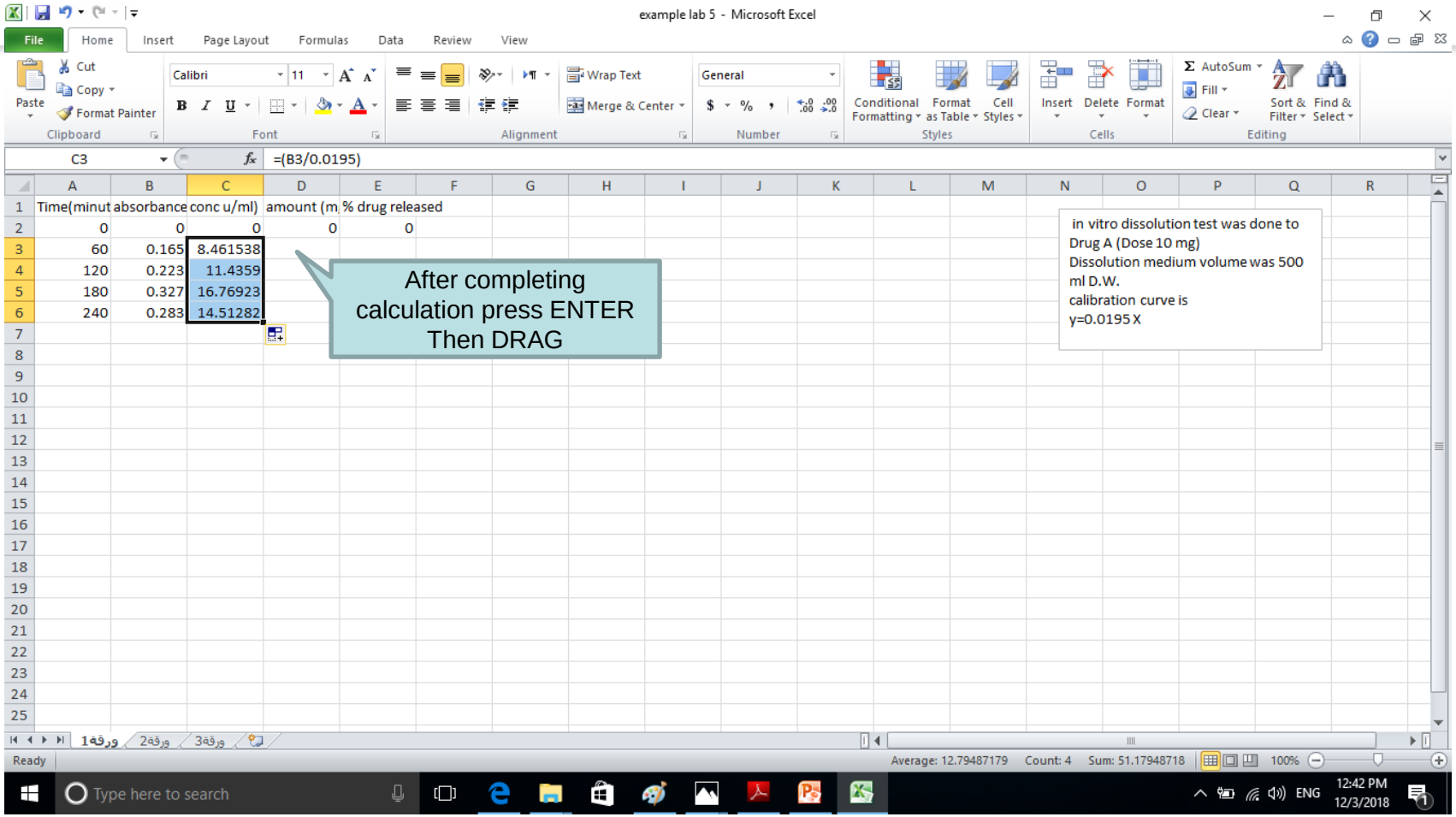
Editing
=(B3/0.0195)
B
C
D
E
F
K
L
M
N
O
P
absorbance
conc u/ml)
amount (m
% drug released
0
0
0
0
0.165
=(B3/0.0195)
0.223
0.327
0.283
in vitro dissolution test was done
Drug A (Dose 10 mg)
ssolution medium volume was 5
D.W.
libration curve is
0.0195 X


example lab 5 - Microsoft Excel
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Conditional Formatting
Format as Table
Cell Styles
Styles
Insert
Delete
Format
Cells
AutoSum
Fill
Clear
Sort & Filter
Find & Select
Editing
C3
=(B3/0.0195)
Time(minut
absorbance
conc u/ml)
amount (m
% drug released
0 0 0 0 0
60 0.165 8.461538
120 0.223 11.4359
180 0.327 16.76923
240 0.283 14.51282
After completing calculation press ENTER Then DRAG
in vitro dissolution test was done to Drug A (Dose 10 mg)
Dissolution medium volume was 500 ml D.W.
calibration curve is
y=0.0195 X
ورقة1
ورقة2
ورقة3
Ready
Average: 12.79487179
Count: 4
Sum: 51.17948718
100%
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ENG
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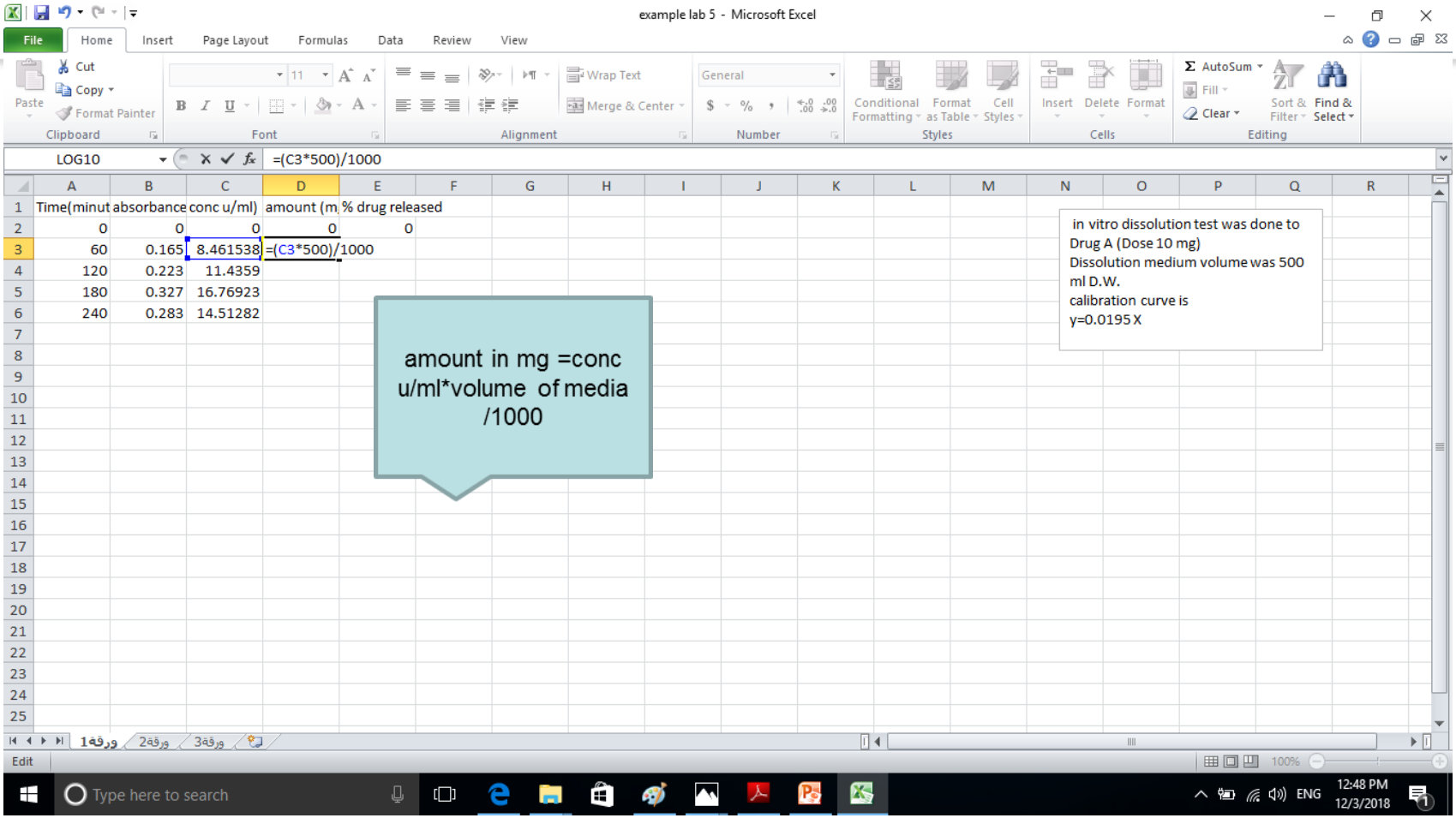
12/3/2018


example lab 5 - Microsoft Excel
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Conditional Formatting
Format as Table
Cell Styles
Styles
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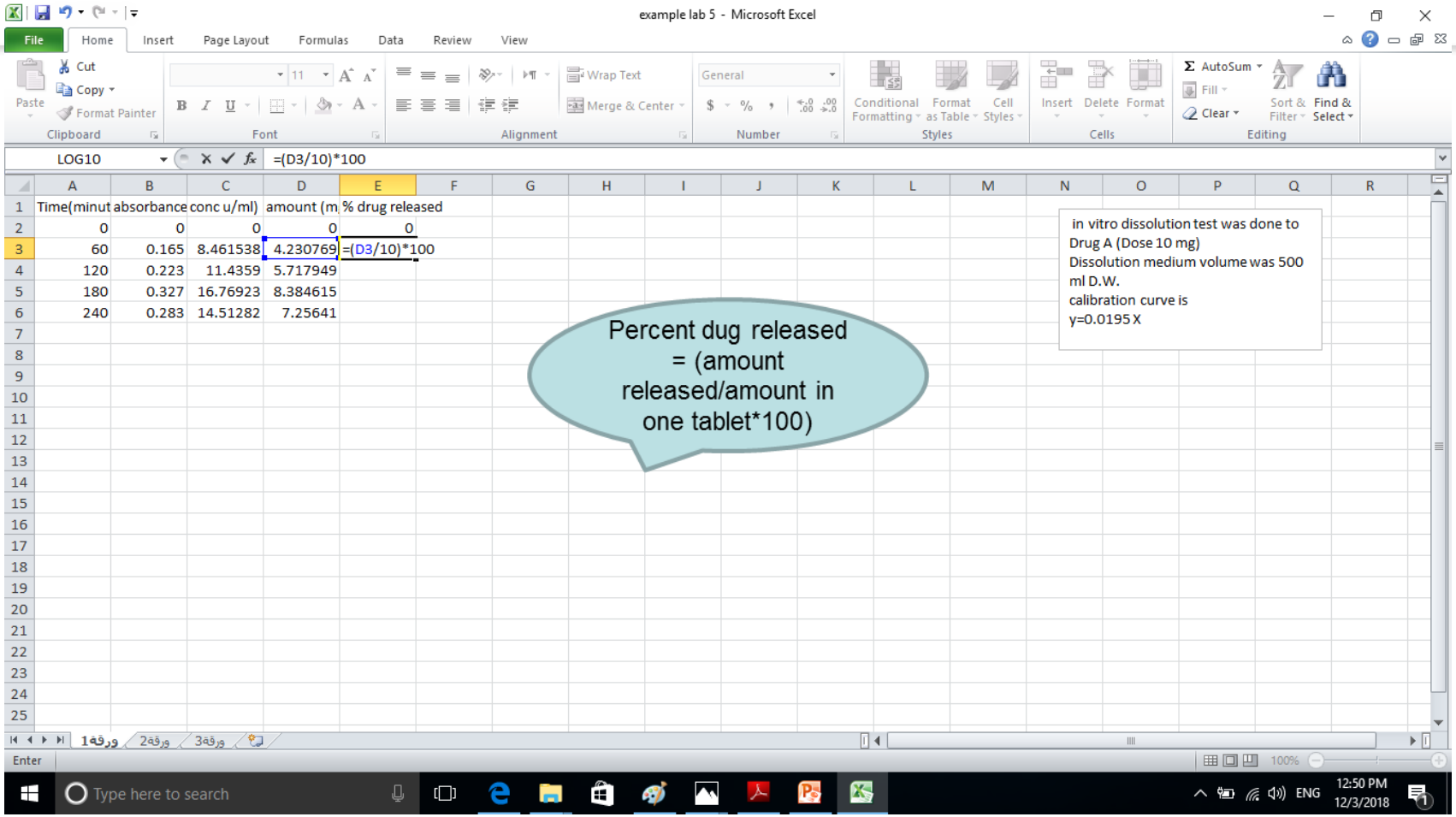
Cells
AutoSum
Fill
Clear
Sort & Filter
Find & Select
Editing
LOG10
=(C3*500)/1000
Time(minut
absorbance
conc u/ml)
amount (m
% drug released
0 0 0 0 0
60 0.165 8.461538 =(C3*500)/1000
120 0.223 11.4359
180 0.327 16.76923
240 0.283 14.51282
in vitro dissolution test was done to
Drug A (Dose 10 mg)
Dissolution medium volume was 500
ml D.W.
calibration curve is
y=0.0195 X
amount in mg =conc
u/ml*volume of media
/1000
ورقة1
ورقة2
ورقة3
Edit
100%
Type here to search
ENG
12:48 PM
12/3/2018


example lab 5 - Microsoft Excel
File
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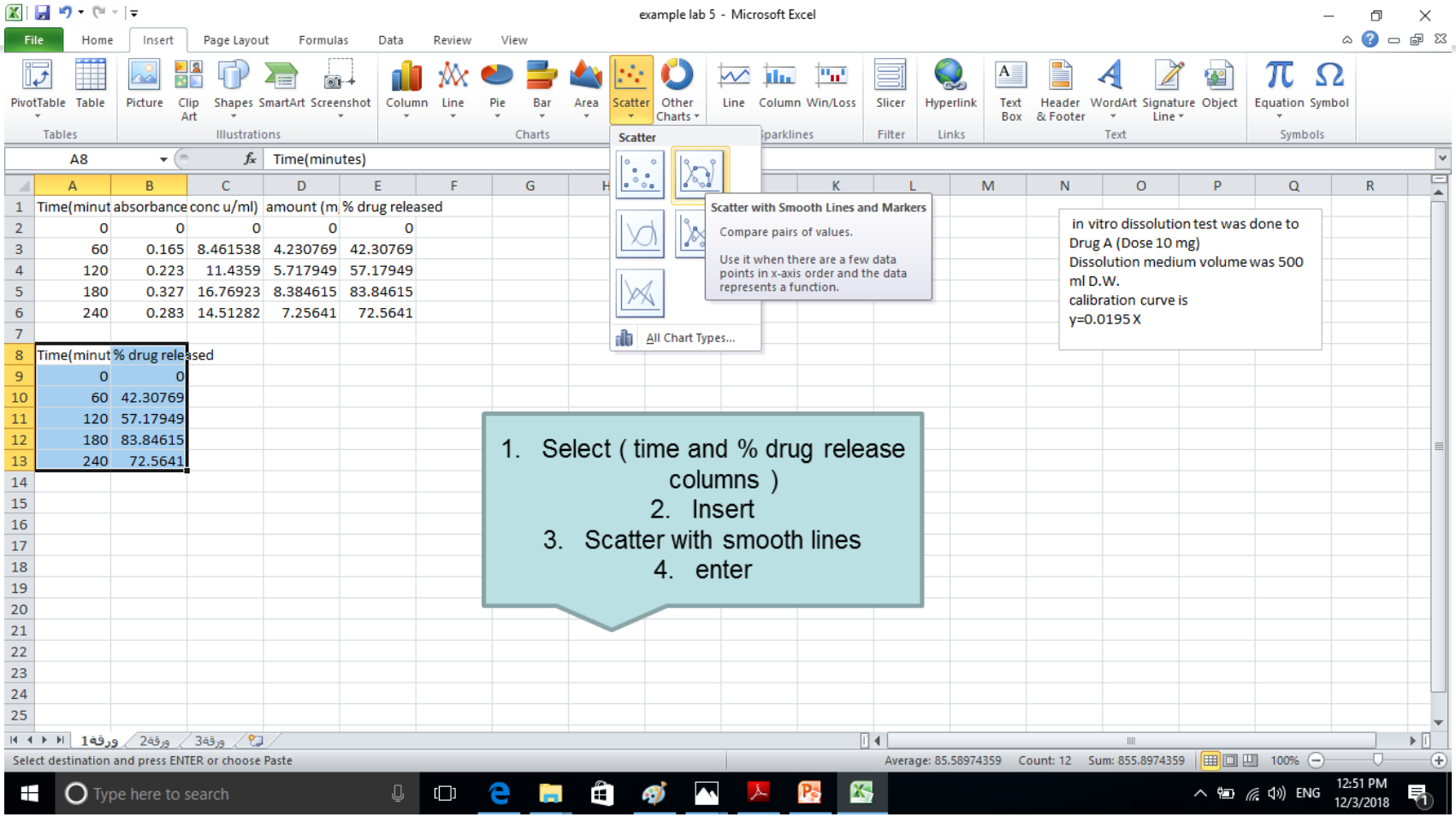
View
LOG10
=(D3/10)*100
Time(minut
absorbance
conc u/ml)
amount (m
% drug released
0 0 0 0 0
60 0.165 8.461538 4.230769 =(D3/10)*100
120 0.223 11.4359 5.717949
180 0.327 16.76923 8.384615
240 0.283 14.51282 7.25641
in vitro dissolution test was done to Drug A (Dose 10 mg)
Dissolution medium volume was 500 ml D.W.
calibration curve is y=0.0195 X
Percent dug released = (amount released/amount in one tablet*100)
ورقة1
ورقة2
ورقة3
Enter
Type here to search
ENG
12:50 PM
12/3/2018


example lab 5 - Microsoft Excel
File
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Page Layout
Formulas
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View
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
A8
Time(minutes)
Scatter
Scatter with Smooth Lines and Markers
Compare pairs of values.
Use it when there are a few data points in x-axis order and the data represents a function.
All Chart Types...
Time(minut absorbance conc u/ml) amount (m % drug released
0 0 0 0 0
60 0.165 8.461538 4.230769 42.30769
120 0.223 11.4359 5.717949 57.17949
180 0.327 16.76923 8.384615 83.84615
240 0.283 14.51282 7.25641 72.5641
Time(minut % drug released
0 0
60 42.30769
120 57.17949
180 83.84615
240 72.5641
in vitro dissolution test was done to Drug A (Dose 10 mg)
Dissolution medium volume was 500 ml D.W.
calibration curve is
y=0.0195 X
1. Select (time and % drug release columns)
2. Insert
3. Scatter with smooth lines
4. enter
Select destination and press ENTER or choose Paste
Average: 85.58974359 Count: 12 Sum: 855.8974359
100%
Type here to search
ENG
12:51 PM
12/3/2018

example lab 5 - Microsoft Excel

Chart Tools

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

Vertical (Value) Axis Majo | Format Selection | Reset to Match Style | Current Selection

Picture | Shapes | Text Box | Insert

Chart Title | Axis Titles | Legend | Data Labels | Data Table

Primary Horizontal Axis Title

Primary Vertical Axis Title

Axes | Gridlines | Axes

Plot Area | Chart Wall | Chart Floor | 3-D Rotation | Background

Trendline | Lines | Up/Down Bars | Error Bars | Analysis

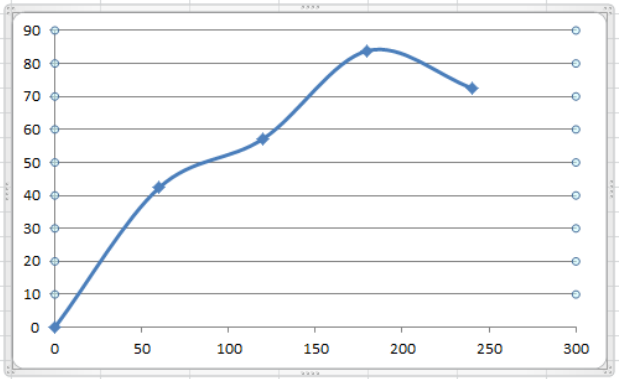
Chart Name: Chart 2 | Properties

Chart 2

To add titles

	A	B	C	D	E
1	Time(minut	absorbance	conc u/ml)	amount (m	% drug released
2	0	0	0	0	0
3	60	0.165	8.461538	4.230769	42.30769
4	120	0.223	11.4359	5.717949	57.17949
5	180	0.327	16.76923	8.384615	83.84615
6	240	0.283	14.51282	7.25641	72.5641
7					
8	Time(minut	% drug released			
9	0	0			
10	60	42.30769			
11	120	57.17949			
12	180	83.84615			
13	240	72.5641			

in vitro dissolution test was done to Drug A (Dose 10 mg)
Dissolution medium volume was 500 ml D.W.
calibration curve is
y=0.0195 X



ورقة1 | ورقة2 | ورقة3

Ready

100%

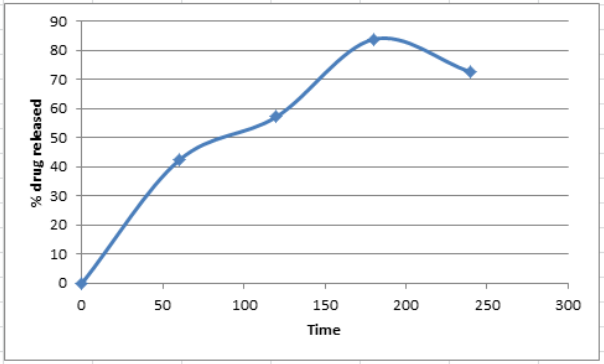
Type here to search

ENG 12:53 PM 12/3/2018

example lab 5 - Microsoft Excel

Time(minut	absorbance	conc u/ml)	amount (m	% drug released
0	0	0	0	0
60	0.165	8.461538	4.230769	42.30769
120	0.223	11.4359	5.717949	57.17949
180	0.327	16.76923	8.384615	83.84615
240	0.283	14.51282	7.25641	72.5641

Time(minut	% drug released
0	0
60	42.30769
120	57.17949
180	83.84615
240	72.5641



in vitro dissolution test was done to Drug A (Dose 10 mg)
Dissolution medium volume was 500 ml D.W.
calibration curve is y=0.0195 X

Thank you