

Making WORD Mathematically Friendly

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1. ADD USEFUL TOOLS: (=> Tools => customise => Commands - drag tools to toolbar)

INSERT: Symbol, Equation Editor, File, Object, Text Box	
FORMAT: Superscript, Subscript	

2. TOOLS => AUTO-CORRECT

- untick "Capitalise first letters of sentences" (for equations)
- Replace - With (eg "Pyt" => Pythagoras' Theorem)
- Auto-formatting: turn off auto-bullet and auto-numbered lists

$\chi^2 \sim N(\mu, \sigma^2)$

*A text expression
created using ALT-keys:*

3. SYMBOLS AS TEXT

Use Insert => Symbol => Font => Normal Text. You can set up short-cut keys as required so that the current font can use its own symbols. The *suggested* ALT keys and some Ctrl keys are:

ALT	2	3	4	H	R	I	O	0	<	>	+	/	↑	↓
Symbol	²	³	¼	½	√	∫	°	∞	≤	≥	±	÷	↑	↓
ALT	A	B	D	E	F	L	M	N	P	S	T	X	←	→
Symbol	α	β	Δ	Σ	φ	λ	μ	ν	π	σ	θ	χ	←	→

- Ctrl keys: Ctrl-E: € Ctrl-L: ℓ Also useful: ⅓ ⅔ ¼ ⅛ ⅝ ⅞ ⅞, γεζηικξρσω, Γ Π Φ Ω, ≡ ≠ ≈ ∩ ∂
- The proper MINUS sign ("—" or "en-dash") is available on **Ctrl -** using the keypad '-'
- Create equations and formulae as **text** if possible. The equation editor creates a **graphic**.

4. Useful ALT numbers

The character map application is useful for inserting symbols when away from Word (eg in an Email or writing a Web Page), and it also gives the ALT-number for direct entry using the KEYPAD: 0128 = €, 0149 = •, 0150 = –, 0163 = £, 0176 = °, 0177 = ±, 0178 = ², 0179 = ³, 0189 = ½, 0247 = ÷

5. TRAPS AND SURPRISES

- Some traps: eg avoid using the "Insert" key [OVR]; keep cAPS IOCK off!
- Format object: vital control of "Position", "Wrapping" (layout), "Colours and lines"
- Some surprises: eg **Shift-Ctrl-<, >** (dynamic font sizing); **Ctrl-[,]** for fine control

Don't forget UNDO (Ctrl-Z) and Re-do (Ctrl-Y), both of which can act continuously (Hold down)



6. FORMULAE AS TEXT: Use (unicode) text characters on one line where possible:

eg: $y = x\sqrt{(1 - x^2)}$ $y = \pi \pm \sin^{-1}(1/2x)$ $\sigma^2 = (1/n)\Sigma(fx^2) - \mu^2$
 $y = e^{\sin^2 x}$ $\int \sin^2 \theta d\theta = \int 1/2(1 - \cos 2\theta)d\theta = 1/2\theta - 1/4 \sin 2\theta + c$
 $\chi^2 \sim N(\mu, \sigma^2)$ $\int \sin^2 \theta \cos \theta d\theta = 1/3 \sin^3 \theta + c$

Characters not defined by ALT or Ctrl-keys can be inserted using 'Insert Symbol'



7. THE EQUATION EDITOR produces a **graphical object**

The equation editor is accessed from 'Insert => Object' or via its button on the toolbar

The equation object can either **move with text**: $sd = \sqrt{\frac{1}{n} f(x - \bar{x})^2}$, or **float over text**

(controlled by right-click over the equation object, then Format Object => "Position" and "Wrapping")

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

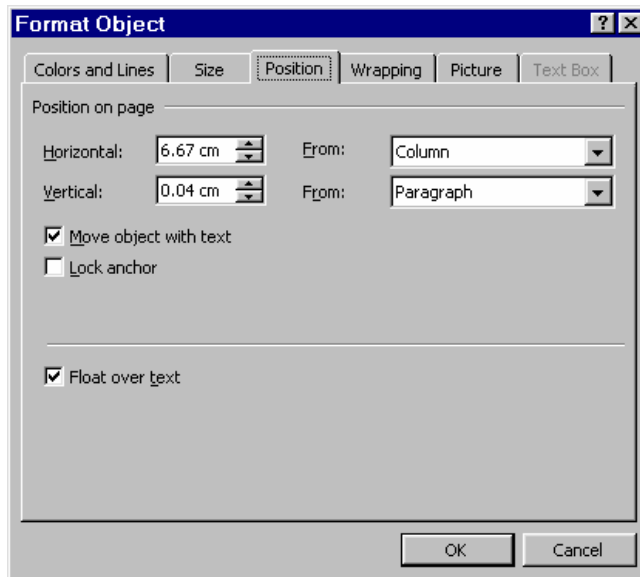
The object can be selected, copied and pasted elsewhere, even into Paint (to re-save as .bmp, .jpeg or .gif). To incorporate an equation into a web page, it needs to be saved (via Paint) as a .gif Surprisingly you can also set up a selected equation as a short-cut in 'tools' => 'auto-correct'.

Integrals: $\int_{\pi/3}^{\pi/2} (1 - \sin^2 2x) dx$

Summations: $\bar{x} = \frac{1}{n} \sum fx$
 $s^2 = \frac{1}{n} \sum fx^2 - \bar{x}^2$

Vectors and Matrices: $\vec{a} = \vec{AB} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$
 $A = \begin{pmatrix} 0 & 2 & 1 \\ -2 & 3 & 1 \\ 0 & 0 & 1 \end{pmatrix}$
 $\det B = \begin{vmatrix} -1 & 3 \\ 2 & 1 \end{vmatrix}$

Series: $e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$



The Format Object menu

Colours and Lines: lines (borders) is available only when in "float over text" mode.

Wrapping is called "layout" in W-2000

Using HYPERLINKS to the INTERNET and beyond

1. USING INTERNET EXPLORER OFF-LINE

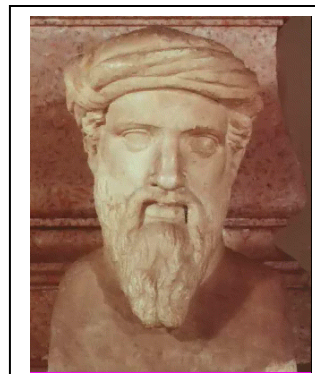
- Just visit sites the night before!
- Use **F11** for full screen operation

2. IMPORTING TEXT AND GRAPHICS OFF THE NET

- Mark any text (including hyperlinks); use right-click "copy"
- To copy any graphic, hover over the graphic; use right-click "copy"

3. IMPORTING DATA in COLUMNS OFF THE NET

- To copy a data file (usually as tab-separated columns), it does not always paste successfully into Word or Excel. Try "paste Special" and use the "Text" option. In Excel, if you find it has all pasted into one column, try using "Data" => "Text to columns".



*Pythagoras of Samos,
c.560-c.480 BC*

4. SOME INTERNET LINKS ARE TO FILES not to other web pages

- If the URL does not end in .htm or .html, it is probably a file that will download
- You have the choice to run the file immediately or save it to disk.
- Running the file will run it in its parent application (if you have it!) eg Excel, or Autograph

5. CREATING A HYPERLINK in WORD

- Either to link to an [internet page](#).
- or to link to (and run) **any file** on the hard-drive, eg Excel or Autograph file
- or to link to a [bookmark](#) within the same document (first use Insert => bookmark)

6. SOME USEFUL WEB RESOURCES

www.tsm-resources.com

This site has been developed over the past 7 years at Oundle School (Peterborough, UK) and lists a constantly evolving selection of links to educational resources:

- **GENERAL REFERENCE and SUBJECT SPECIFIC sites**

- **MATHEMATICS sites**

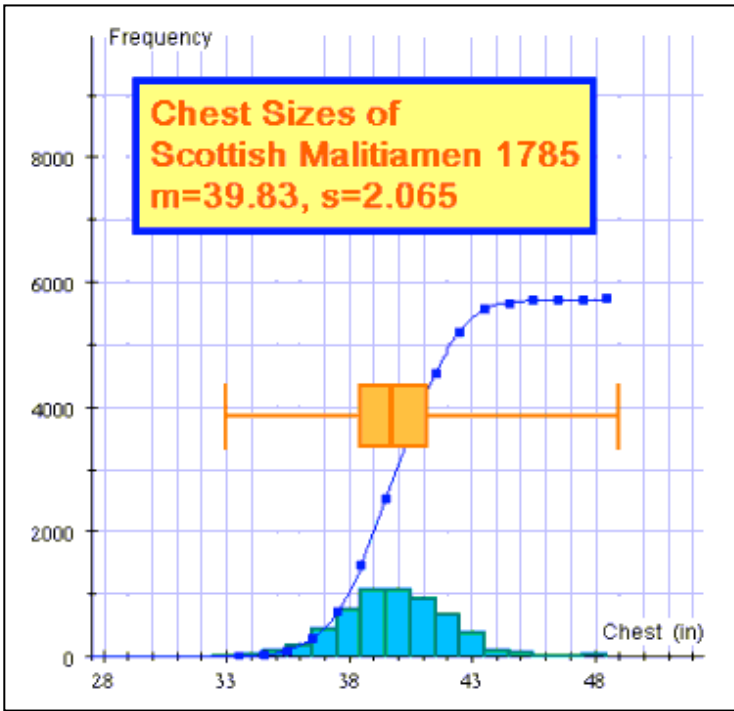
- Mathematical Associations and Magazines
- Mathematical Resources; Mathematical Entertainment
- Statistical Resources
- **Suppliers and creators of mathematical software**
- **Useful Files for Mathematics (.xls, .gsp, etc)**

- **AUTOGRAPH Resources**

www.autograph-maths.com


- Autograph "graph" files (.agg)
- Autograph "statistics" files (.ags)
- Screencam recordings (.scm)
- Word files: worksheets, lesson plans (.doc)
- Viewlet Tutorials **NEW!**

- WORD documents can contain items pasted from other applications eg a graph or text from Autograph – best placed in a text box for greater control:



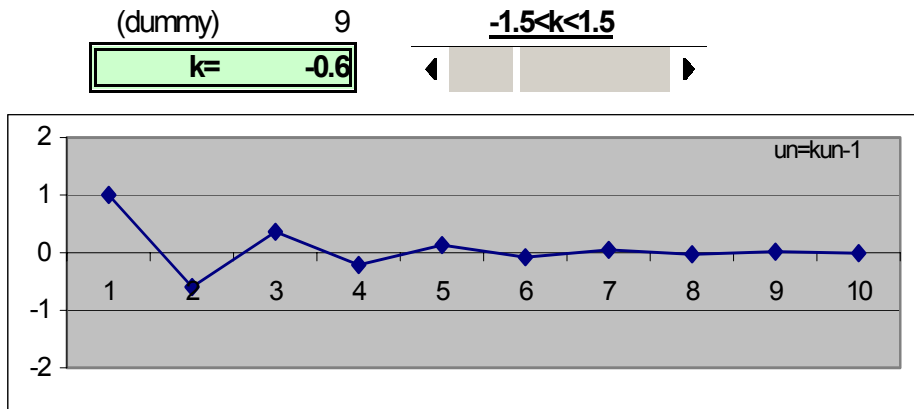
Scottish Militiamen (1785):

x	f	cf.
33	3	3
34	18	21
35	81	102
36	185	287
37	420	707
38	749	1456
39	1073	2529
40	1079	3608
41	934	4542
42	658	5200
43	370	5570
44	92	5662
45	50	5712
46	2	5714
47	3	5717
48	18	5735

- WORD documents can contain embedded spreadsheets, using  This way the spreadsheet remains 'live' and can be activated by double-clicking

ILLUSTRATING THE GEOMETRIC PROGRESSION

n	$u_n = ku_{n-1}$
1	1.0000
2	-0.6000
3	0.3600
4	-0.2160
5	0.1296
6	-0.0778
7	0.0467
8	-0.0280
9	0.0168
10	-0.0101



Making the best use of PAINT

Paint is so useful it is worth putting it on your **start menu**

You will find it in Start => Programs => Accessories. It should be in the list there.

Right-click drag the Paint icon and drop it on the Start button (bottom left). Voilà

Getting an image onto the clipboard:

Use the **PrtSc** (Print Screen) button any time to copy the whole screen to the clip-board

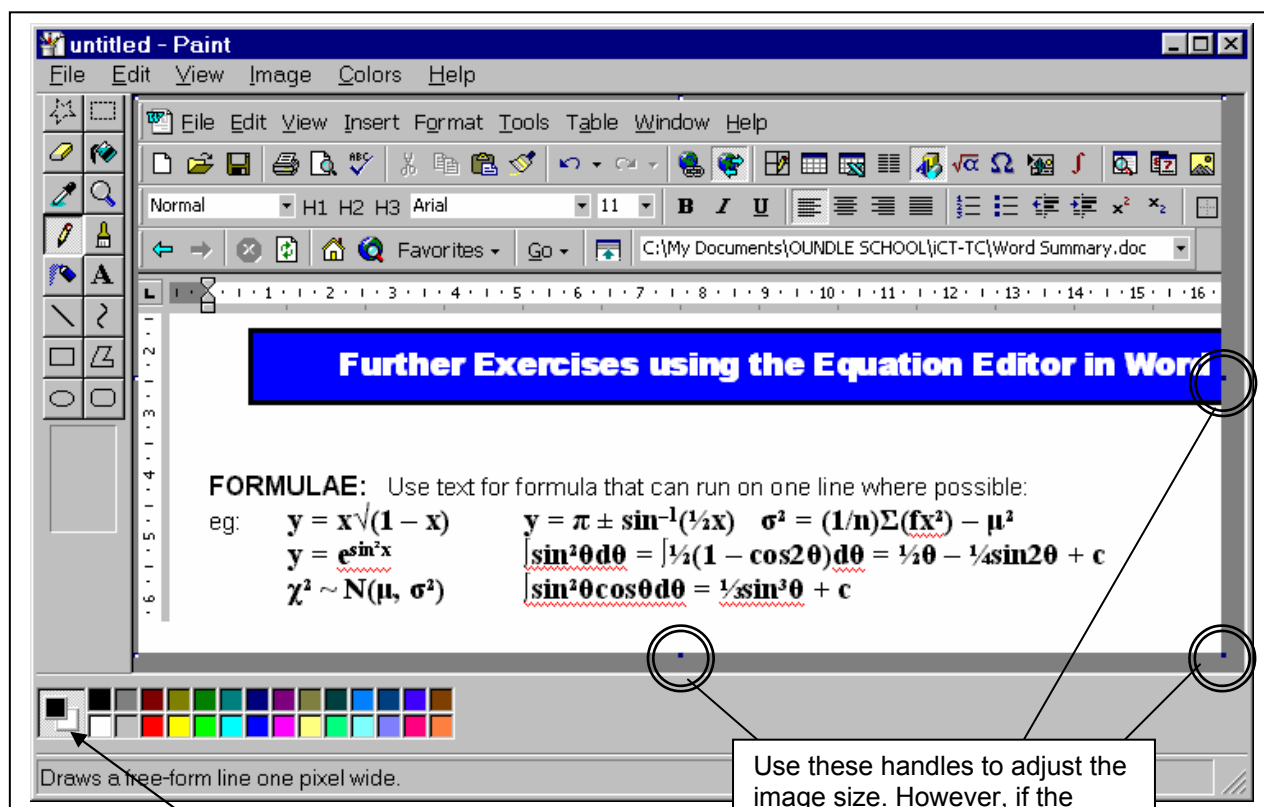
Use **ALT-PrtSc** to copy the currently selected window to the clipboard

Otherwise any graphic object can be selected, copied and pasted into Paint.

In Autograph, use the "Page" menu (note, **Ctrl-C** copies the whole screen as a bit-map image)

Pasting into Paint

At first the image is a BITMAP (.bmp). and is already selected. You can click-drag the whole image around to help with initial cropping of the image.



Some useful features:

File => Save As can be **.jpeg** (for photos), or **.gif** (for other images - MUCH smaller than bitmaps **.bmp**)

The colour palette: the colour behind represents the right-click colour.

Use Ctrl-A to select the whole image to copy and paste out, or to move it all about.

You can paste further bit-maps - they appear in the left corner and can be moved to the required position.