# An intro to the typesetting of basic mathematics in MS Word using *LaTeX* code

In order to insert equation, press **ALT** and **=** at once: Type equation here. If, like in this case, you are writing a sentence, it becomes an inline equation; otherwise, the *Type equation here* is justified at the center of the line:

Type equation here.

You can also type the code, select it and the press **ALT** and **=** at once.

Onco you proce AI	T and - coloct I o'	<b>TeX</b> on the insert menu:
Once you press Al	JI and =, select La	<b>IEX</b> on the insert menu:

Insert	Draw	Design	Layout	References	Mailings	Review	View	Help
/ Unicod { } LaTeX abc Text	le $\mathcal{C}_{e^{\lambda}x}^{x}$ Convert	t ≥	∞ = ∓ ≅	≠ ~ × ≈ Ξ ∀	÷! •	< < ≪ / ∛ ∜	) > ; U (	»> ≤ ∩ Ø
Convers	sions	ы			Symbols			
Then type t	he equatio	on and pre	ss the ente	r key; or click		er corner ar	row and	select
Professiona	ıl:							
	ssional Inline							
a) For ex	ponents u	se the care	et ^					
ax^n+	bx^m+cx^	{kn} + dx^{r	n+n}		a	$x^n + bx^m + b$	$cx^{kn} + c$	$dx^{m+n}$
b) For su	bscripts u	se underso	core _					
ax_n +	- bx_{n+1}	^m				$ax_n +$	$bx_{n+1}^m$	
c) Fractio							a b	
3	3x+1}{x^2-:	1}					$\frac{+1}{-1}$	
<u> </u>								
d) Radica	als:							
Sauare	a root \ca	rtjvl					Lac.	

Square root \sqrt{x}	$\sqrt{x}$
For all others <i>nth</i> roots: \sqrt[n]{x}	$\sqrt[n]{x}$
Specifically, \cbrt {x} yields the cubic root	$\sqrt[n]{x}$

## e) Absolute value:

,			
	Use the bar on the keyboard $ $ , like $ x - 5 $	<i>x</i> -5	

f) Inequalities: for strict inequalities, use the symbols on the keyboard; still, you should insert the<br/>equation; for example, 5 > 2 becomes 5 > 2 and 2 < 5 becomes 2 < 5For greater or equal type \geq $\geq$ For less than or equal type \leq $\leq$ 

#### g) Other commonly used symbols:

Not equal to: \neq $\neq$ Approximately equal: \approx $\approx$ Congruent: \cong $\cong$ x bar: \bar{x} $\bar{x}$ p hat: \hat{p} $\hat{p}$ Vector: \vec{AB} $\bar{AB}$ Line segment: AB, \overbar {AB} $A \cdot B$ Multiplication dot: A \cdot B $A \cdot B$ x to indicate multiplication: A \times B $A \times B$ The division symbol: \div $\div$ Plus and minus: \pm $\pm$ Infinity: \infty $\infty$ if-and-only-if: \tiff $\Leftrightarrow$ Implies: \Rightarrow $\Rightarrow$	outer commonly abou symbols.	
Congruent: \cong $\cong$ x bar: \bar{x} $\bar{x}$ p hat: \hat{p} $\hat{p}$ Vector: \vec{AB} $\overline{AB}$ Line segment: AB, \overbar {AB} $\overline{AB}$ Multiplication dot: A \cdot B $A \cdot B$ x to indicate multiplication: A \times B $A \times B$ The division symbol: \div $\div$ Plus and minus: \pm $\pm$ Therefore: \therefore $\therefore$ Infinity: \infty $\infty$ if-and-only-if: \iff $\leftrightarrow$	Not equal to: \neq	≠
x bar: \bar{x} $\bar{x}$ p hat: \hat{p} $\hat{p}$ Vector: \vec{AB} $\overline{AB}$ Line segment: AB, \overbar {AB} $\overline{AB}$ Multiplication dot: A \cdot B $A \cdot B$ x to indicate multiplication: A \times B $A \times B$ The division symbol: \div $\div$ Plus and minus: \pm $\pm$ Therefore: \therefore $\therefore$ Infinity: \infty $\infty$ if-and-only-if: \iff $\leftrightarrow$	Approximately equal: \approx	~
p hat: $\langle hat \{p\}$ $\hat{p}$ Vector: $\langle vec \{AB\}$ $\overrightarrow{AB}$ Line segment:AB, \overbar {AB} $\overrightarrow{AB}$ Multiplication dot:A \cdot B $A \cdot B$ X to indicate multiplication:A \times B $A \times B$ The division symbol: $\langle div$ $\div$ Plus and minus: $\langle pm$ $\pm$ Therefore: $\langle therefore$ $\therefore$ Infinity: $\langle infty$ $\infty$ if-and-only-if: $\langle iff$ $\Leftrightarrow$	Congruent: \cong	¥
Vector: $\langle Vec{AB} \rangle$ $\overrightarrow{AB}$ Line segment: AB, $\langle overbar \{AB\} \rangle$ $\overrightarrow{AB}$ Multiplication dot: A $\langle cdot B \rangle$ $A \cdot B$ x to indicate multiplication: A $\langle times B \rangle$ $A \times B$ The division symbol: $\langle div \rangle$ $\div$ Plus and minus: $\langle pm \rangle$ $\pm$ Therefore: $\langle therefore \rangle$ $\therefore$ Infinity: $\langle infty \rangle$ $\infty$ if-and-only-if: $\langle iff \rangle$ $\Leftrightarrow$	x bar: \bar{x}	$\bar{x}$
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The division symbol: \div     ÷       Plus and minus: \pm     ±       Therefore: \therefore     ∴       Infinity: \infty     ∞       if-and-only-if: \iff     ↔	Multiplication dot: A \cdot B	$A \cdot B$
Plus and minus: \pm $\pm$ Therefore: \therefore $\therefore$ Infinity: \infty $\infty$ if-and-only-if: \iff $\Leftrightarrow$	x to indicate multiplication: A \times B	$A \times B$
Therefore: \therefore     ∴       Infinity: \infty     ∞       if-and-only-if: \iff     ↔	The division symbol: \div	÷
Infinity: \infty     ∞       if-and-only-if: \iff     ⇔	Plus and minus: \pm	±
if-and-only-if: \iff ↔	Therefore: \therefore	
	Infinity: \infty	0
Implies: $Rightarrow \Rightarrow$	if-and-only-if: \iff	$\Leftrightarrow$
	Implies: \Rightarrow	⇒

h) Greek letters:

\alpha	α
\beta	β
\theta	θ
\sigma and \sigma^2	$\sigma$ and $\sigma^2$

#### i) Logarithmic functions:

\log {x}	log x
\log_b {x}	$\log_b x$
\log_b^2 {x}	$\log_b^2 x$
\ln {x}	$\ln x$

## j) Trigonometry:

\sin {x} and \cos{x}	$\sin x$ and $\cos x$
$\sin^{2}{x} + \cos^{2}{x} = 1$	$\sin^2 x + \cos^2 x = 1$
$\tan^2 {x} + 1 = \sec^2 {x}$	$\tan^2 x + 1 = \sec^2 x$
90^{\circ}	90°
\angle \theta	∠θ

## k) Generating a box:

\rect { \frac{a+c}{a-c} }	a+c
	$\overline{a-c}$

l) Sets:

Set3.	
Union of sets: \cup	U
Intersection of sets: \cap	Ω
The empty set: \emptyset	Ø

## m) Calculus: summations, limits, derivatives and integrals:

Calculus. Summations, minus, der ivatives and mitegi	
\sum_1^n i = \frac{n}{2}(n+1)	$\sum_{1}^{n} i = \frac{n}{2}(n+1)$
\sum_{n=1}^\infty i	$\sum_{n=1}^{\infty} i$
e^x=\sum_{n=0}^\infty \frac{x^n}{n!}	$e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$
$\lim_{n \to 0} (1 + frac{1}{n})^n$	$\lim_{n \to \infty} \left( 1 + \frac{1}{n} \right)^n$
\frac{du}{dt}	$\frac{du}{dt}$
\frac{d^2 u}{dx^2}	$\frac{d^2u}{dx^2}$
\int_a^b f(x) dx	$\int_{a}^{b} f(x) dx$
\int_0^{+\infty} x^n e^{-x} dx	$\int_0^{+\infty} x^n e^{-x} dx$

n) Solving equations step by step:

3x + 2 = 53x = 3

x = 1

This is the procedure: do not press return once you've finished typing your first line. Press SHIFT and ENTER on the keyboard to move to a new line. SHIFT and ENTER creates a new line without creating a new paragraph. Type your next line and press SHIFT and ENTER to move onto a new line. Repeat step 3 to build your equation. Once you have typed out your equation fully, you will move on to aligning it. Right-click in front of the first equal sign of your equation. A drop-down menu will be displayed. Choose Align at this Character from the drop-down menu options - it may look like nothing has happened, however continue on. Do this for each line.

# o) The quadratic formula:

x_{1,2} = \frac{-b \pm \sqrt {b^2-4ac}}{2a}	$-b \pm \sqrt{b^2 - 4ac}$
	$x_{1,2} = \frac{2a}{2a}$

# p) A matrix:

\bmatrix{a & b & c \\ d & e & f \\ g & h & i}	abcdefghi
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# q) <u>Determinants</u>:

Determinants.	
a \vmatrix{e & f \\ h & i} – b \vmatrix{d & f \\ g & i} + etc	$a\begin{vmatrix} e & f \\ h & i \end{vmatrix} - b\begin{vmatrix} d & f \\ g & i \end{vmatrix} + etc$
which leads to: a \cdot (ei-hf) – b \cdot (df-hi) + etc	which leads to: $a \cdot (ei - hf) - b \cdot (df - hi) + etc$

# r) Statistics (basic formulae):

Statistics (basic formulae):	
Mean for individual data: \bar{x} = \frac{\sum x_i }{n}	$\bar{x} = \frac{\sum x_i}{n}$
Population Variance: \sigma^2= \frac{\sum (x_i -\mu)^2}{n}	$\sigma^2 = \frac{\sum (x_i - \mu)^2}{n}$
Sample standard deviation: s=\sqrt{\frac{\sum (x_i-\bar{x})^2}{n-1}}	$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n - 1}}$ $z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$ $\bar{x} \pm E$
Central limit theorem formula: z = \frac { \bar{x} - \mu }{ \sigma / \sqrt{n}}	$z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$
z confidence interval for means: \bar{x} \pm E, where Error, E = z_{\alpha /2} ( \frac{\sigma}{\sqrt{n}} )	where $E = z_{\alpha/2} \left( \frac{\sigma}{\sqrt{n}} \right)$
t confidence interval for means: \bar{x} \pm E, where Error, E =t_{\alpha /2} ( \frac{s}{\sqrt{n}} )	$\bar{x} \pm E$ where $E = t_{\alpha/2} \left(\frac{s}{\sqrt{n}}\right)$
Confidence interval for a proportion: \hat{p} \pm E, where Error, E = z_{\alpha /2} \sqrt{\frac{\hat{p} \cdot \hat{q}}{n}}	$\hat{p} \pm E$ where $E = z_{\alpha/2} \sqrt{\frac{\hat{p} \cdot \hat{q}}{n}}$ $n = \left(\frac{\sigma \cdot z_{\alpha/2}}{E}\right)^2$
Sample size for means: n = (\frac{\sigma \cdot z_{\alpha /2}}{E})^2	$n = \left(\frac{\sigma \cdot z_{\alpha/2}}{E}\right)^2$
Sample size for a proportion: n= \hat{p} \hat{q} (\frac {z_{\alpha /2}}{E})^2	$n = \hat{p}\hat{q}\left(\frac{Z_{\alpha/2}}{E}\right)^2$