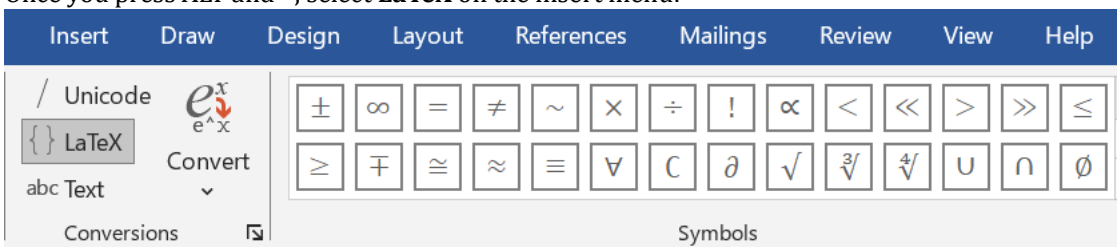
An intro to the typesetting of basic mathematics in MS Word using *LaTeX* code

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:

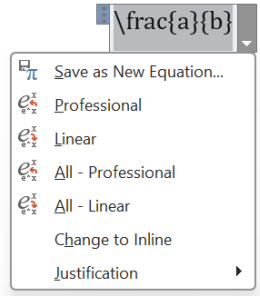
Type equation here.

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

Once you press ALT and =, select **LaTeX** on the insert menu:



Then type the equation and press the enter key; or click the right lower corner arrow and select Professional:



a) For exponents use the caret ^

ax^n+bx^m+cx^{kn} + dx^{m+n}	$ax^n + bx^m + cx^{kn} + dx^{m+n}$

b) For subscripts use underscore _

ax_n + bx_{n+1}^m	$ax_n + bx_{n+1}^m$

c) Fractions:

\frac{a}{b}	$\frac{a}{b}$
\frac{3x+1}{x^2-1}	$\frac{3x+1}{x^2-1}$

d) Radicals:

Square root \sqrt{x}	$\sqrt{x}$
For all others *nth* 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|	$\|x-5\|$

f) Inequalities: for strict inequalities, use the symbols on the keyboard; still, you should insert the equation; for example, 5 > 2 becomes $5 > 2$ and 2< 5 becomes $2 < 5$

For 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}	$\vec{AB}$
Line segment: AB, \overbar {AB}	$\overline{\mathrm{AB}}$
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	∞
if-and-only-if: \iff	$\Leftrightarrow$
Implies: \Rightarrow	$\Rightarrow$

h) Greek letters:

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

k) Generating a box:

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

l) Sets:

Union of sets: \cup	$\cup$
Intersection of sets: \cap	$\cap$
The empty set: \emptyset	$\emptyset$

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

\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 \infty} (1 + \frac{1}{n})^n	$\lim_{n \to \infty} (1 + \frac{1}{n})^n$
\frac{du}{dt}	$\frac{du}{dt}$
\frac{d^2 u}{dx^2}	$\frac{d^2 u}{dx^2}$
\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:

$$\begin{aligned} 3x + 2 &= 5 \\ 3x &= 3 \\ x &= 1 \end{aligned}$$

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

p) A matrix:

\bmatrix{a & b & c \\ d & e & f \\ g & h & i}	$\begin{bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{bmatrix}$

q) Determinants:

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

r) 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}}	$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}}$
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}})	$\bar{x} \pm E$ 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 $E = z_{\alpha/2}\sqrt{\frac{\hat{p} \cdot \hat{q}}{n}}$
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	$n = \hat{p}\hat{q}\left(\frac{z_{\alpha/2}}{E}\right)^2$