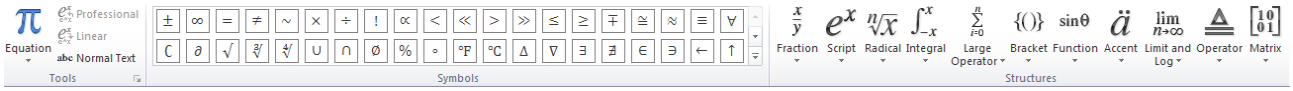
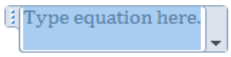
The aim of the laboratory is to get acquainted with basic equation editing in word 2010.

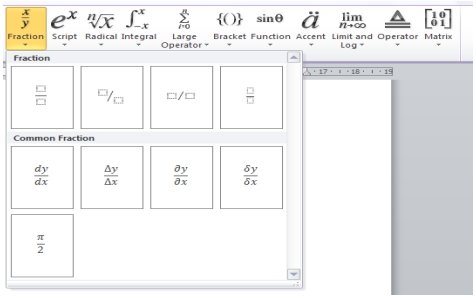
The equation editor in word 2010 is an extension version of the previous Microsoft Equation 3.0 devdelooped by Design Science that allows user to insert common equation of build their own using a library of math symbols in a WYSIWYG environment. It can be installed as a separate module during the first installation of the package or can be added later to the existing installation. In order to use the equation editor you have to go to ***Insert*** tab → ***Symbol*** section then click on ***Equation***. Then, the following toolbar appears:



Equations are inserted into a document as a part of a paragraph text – they cannot be placed anywhere, as they obey the same rules as text you type. The region occupied by an equation is marked as in the picture below:



The editor's toolbox consists of a set of symbol groups (as their similar meaning or application). You can access a particular symbol by clicking on one of the groups (the popup appears):
The ordinary symbols (e.g. letters, digits, special character) can be entered directly from keyboard.



Hints:

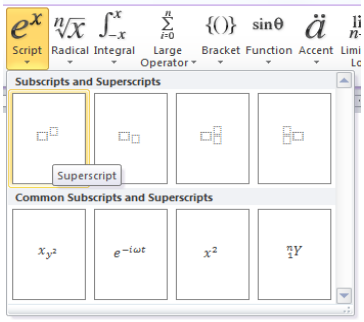
1. When you need to type a space, use Ctrl+Space key.
2. You can scale the equation as any other MS Word object.
3. You can copy and paste (reuse) existing equation elements.

Exercise 1

Enter the following equation: $E = mc^2$
Follow the steps:

1. In the equation region type E=:

2. From the Script toolbox choose Superscript. This inserts 2 dashed rectangles in the equation:



3. Type *mc* and *2* in corresponding rectangles:

4. Click anywhere outside the equation.

Remark: another solution would have been to insert a common Superscript (e.g. x^2), and replace *x* by *mc*.

Exercise 2

Enter the following equation: $a^2 + b^2 = c^2$

Exercise 3

Enter the following equation: $\oint_L \vec{B}.\overrightarrow{dl} = \mu_0 I + \mu_0 \varepsilon_0 \frac{d\Phi_E}{dt}$

Exercise 4

Enter the following equation:

$$f^{(n)}_{ei_1 \ldots ei_n} = \left(f^{(n-1)}_{ei_1 \ldots ei_{n-1}}\right)'_{ei_n}(a) =$$
$$= \frac{\partial}{\partial x_{i_n}}\left(\frac{\partial^{n-1} f}{\partial x_{i_{n-1}} \ldots \partial x_{i_n}}\right)(a) =$$
$$= \frac{\partial^n f}{\partial x_{i_n} \ldots \partial x_{i_1}}(a)$$

Hint: use a matrix (3 rows), click-right on the equation and set the column aligment to *Left*.Add spaces as explained above to align the equal signs (=).

Exercise 5

Enter the following equation:

$$f(x_1, x_2) = \begin{cases} \frac{x_1 x_2^3}{x_1^2 + x_2^6} & for\ (x_1, x_2) \neq (0,0) \\ 0 & for\ (x_1, x_2) = (0,0) \end{cases}$$

Exercise 6

Enter the following equation: $\exists \varepsilon_0 > 0 \;\; \forall k \in N \;\; \exists x_1,...,x_k \in X \;\; \exists x \in X \;\; x \notin \bigcup_{i=1}^{k} K(x_1, \varepsilon_0)$

Exercise 7

Enter the following equation: $\begin{bmatrix} f_1(x) \\ \vdots \\ f_n(x) \end{bmatrix} = \begin{bmatrix} a_{11} & \cdots & a_{1m} \\ \vdots & \ddots & \vdots \\ a_{n1} & \cdots & a_{nm} \end{bmatrix} \begin{bmatrix} x_1 \\ \vdots \\ x_n \end{bmatrix}$