LaTeX Symbol Reference for High School Level Mathematics Using Edmodo

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Preface

This document's primary purpose is to provide an introduction to the use of LaTeX, the document preparation system / markup language / typesetting system that among other things can be used to create complex formulas. There are many tools which can be used to render, or display, results of your LaTeX code, but this document will concentrate on using LaTeX to create formulas within Edmodo.

There are many possible mathematical symbols to create virtually any conceivable equation / formula using LaTeX. As a High School Math Teacher in Iowa, USA, I don't need the plethora of symbols. I have endeavored to create a document that only covers the symbols I believe to have the most direct usage by teachers of first year Algebra and Geometry. I may miss some and would be happy to modify the document with additional symbols and examples.

Entering LaTeX Markup Language in Edmodo

In Edmodo to include a formula using LaTeX you need to enclose it in the math tags. It is important to note, while you are entering the formulas YOU WILL NOT SEE THE FORMULA AS IT WILL BE DISPLAYED! If you are posting a Note, it will display once it is Sent. If you are posting a Quiz, you can Preview it to see the results of the formula. Etc.

Examples

[math] your LaTeX formula **[/math]**

Displayed while editing

What values for x will not work in the following equation? [math] y = \frac 1 {x^2} [/math]

Displayed when posted

What values for x will not work in the following equation? $y = \frac{1}{x^2}$

Whitespace in LaTeX

Whitespace is important in LaTeX. Merely pressing the space bar may not give the desired effect. To ensure items are included together in a term they need to be contained in squiggly brackets { }. If they are not there can be some odd consequences until you understand how LaTeX deals with separating items / grouping items.

Examples

[math] \frac ab cd [/math]
$\frac{a}{b}cd$

[math] \frac {ab} cd [/math]
$\frac{ab}{c}d$

[math] \frac a{b c}d [/math]
$\frac{a}{bc}d$ note: space removed between b and c

[math] \frac {ab} {cd} [/math]
$\frac{ab}{cd}$

Explicit Space

If you absolutely need a space within a formula and it is not being placed appropriately, you can apply the explicit space. This is the backslash followed by pressing the space bar. It needs to be described because it looks like \ which is impossible to distinguish from just \.

Format of Reference Section

General Description / Common Name of the Symbol / Operator	Sample Usage	Exact Code Which Produces the Sample Usage (Can be copied and pasted into Emodo for you to modify and experiment with.)	Syntax of the LaTeX command / code

Table of Codes

General Codes (through approximately Algebra I / Geometry)			
Fractions	$\frac{1}{2}$	[math]\frac 1 2[/math]	\frac {numerator} {denominator}
Not Equal	$1 \neq 2$	[math]1 \neq 2[/math]	{n} \neq {m}
Less than or equal	$x \leq 8$	[math]x \leq 8[/math]	{n} \leq {m}
Greater than or equal	$x \geq -3$	[math]x \geq -3[/math]	{n} \geq {m}
Multiplication dot	$2 \cdot 3$	[math]2 \cdot 3[/math]	{n} \cdot {m}
Multiplication X	2×3	[math]2 \times 3[/math]	{n} \times {m}
Divide	$3 \div 5$	[math]3 \div 5[/math]	{n} \div {m}
Plus or Minus / Plus Minus	$x \pm 3$	[math]x \pm 3[/math]	{n} \pm {m}
Superscript / Exponent	x^2	[math]x^2[/math]	{base}^{exponent}
Subscript	x_i	[math]x_i[/math]	{base}_{subscript}
Superscript AND Subscript	x_n^4	[math]x_n^4[/math] or [math]x^4_n[/math]	{base}_{sub.}^{exp.} or {base}^{exp.}_{sub.}
Square Roots	$\sqrt{2}$	[math]\sqrt 2[/math]	\sqrt {n}
Other Roots	$\sqrt[3]{4+a}$	[math]\sqrt[3] {4 + a}[/math]	\sqrt[{n}] {m}
Absolute Value	$\lvert x+1 \rvert$	[math]\lvert x + 1 \rvert[/math]	\lvert {n} \rvert
Point	$\bullet P$	[math]\bullet P[/math]	\bullet {n}
Angle	$\angle ABC$	[math]\angle ABC[/math]	\angle {name of angle}
Congruent	$\angle 1 \cong \angle 2$	[math]\angle 1 \cong \angle 2[/math]	{n} \cong {m}
Degree	$m\angle ABC = 15^\circ$	[math]m\angle {ABC} = 15 ^ \circ[/math]	{n} ^ \circ

Approximately equal	$1.9 \approx 1.88$	[math]1.9 \approx 1.88[/math]	{n} \approx {m}
Triangle	$\triangle ABC$	[math]\triangle ABC[/math]	\triangle {triangle name}
Similar	$\triangle ABC \sim \triangle EFG$	[math]\triangle ABC \sim \triangle EFG[/math]	{n} \sim {m}
Line Segment	$\overline{AB}$	[math]\overline {AB}[/math]	\overline {line segment name}
Line	$\overleftrightarrow{AB}$	[math]\overleftrightarrow {AB}[/math]	\overleftrightarrow {line name}
Ray	$\overrightarrow{AB}$	[math]\overrightarrow {AB}[/math]	\overrightarrow {ray name}
Perpendicular	$\overline{AB} \perp \overline{CD}$	[math]\overline {AB} \perp \overline {CD}[/math]	{n} \perp {m}
Parallel	$\overline{AB} \parallel \overline{CD}$	[math]\overline {AB} \parallel \overline {CD}[/math]	{line1} \parallel {line 2}
Not Parallel	$\overline{AB} \nparallel \overline{CD}$	[math]\overline {AB} \nparallel \overline {CD}[/math]	{line1} \nparallel {line 2}
Circle	$\bigodot$	[math]\bigodot[/math]	\bigodot
Square	$\square$	[math]\square[/math]	\square
Pi	π	[math]\pi[/math]	\pi
Maps To	$(x, y) \mapsto (x + 1, y - 5)$	[math](x,y) \mapsto (x+1, y-5)[/math]	{n} \mapsto {m}

Matrices / Arrays			
Matrix	$\left[\begin{array}{cc} R1C1 & R1C2 \\ R2C1 & R2C2 \end{array}\right]$	[math]\left [\begin{array}{cc}{{R1C1} & {R1C2} \\ {{R2C1} & {R2C2}\end{array}\right][/math]	\left [\begin{array}{num of c's =number of columns} {{R1C1} & {R1C2} \\ {{R2C1} & {R2C2} \\ etc. \end{array}\right]
Augmented Matrix	$\left[\begin{array}{ccc\|c} R1C1 & R1C2 & R1C3 & R1C4 \\ R2C1 & R2C2 & R2C3 & R2C4 \\ R2C1 & R3C2 & R3C3 & R3C4 \end{array}\right]$	[math]\left [\begin{array}{ccc|c} {{R1C1} & {R1C2} & {R1C3} & {R1C4}\\ {{R2C1} & {R2C2} & {R2C3} & {R2C4}\\ {{R2C1} & {R3C2} & {R3C3} & {R3C4}\end{array}\right][/math]	[math]\left [\begin{array}{ccc|c}{{R1C1} & {R1C2} & {R1C3} & {R1C4}\\{{R2C1} & {R2C2} & {R2C3} & {R2C4}\\{{R2C1} & {R3C2} & {R3C3} & {R3C4} \end{array} \right][/math]

Some Common Formula Examples		
Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	[math]x = \frac {-b \pm {\sqrt {b^2 -4ac}}} {2a}[/math]
Slope Formula	$m = \frac{y_2 - y_1}{x_2 - x_1}$	[math]m = \frac {y_2-y_1} {x_2-x_1}[/math]
Distance Formula	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	[math]d = \sqrt {\left(x_2-x_1\right)^2 + \left(y_2-y_1\right)^2}[/math]
Midpoint Formula	$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$	[math]\left(\frac {x_1+x_2} 2 , \frac {y_1+y_2} 2\right)[/math]
Rectangle Area	$A = bh$	No code necessary, but if you want... [math]A=bh[/math]
Triangle Area	$A = \frac{bh}{2}$	[math]A=\frac {bh} 2[/math]
Trapezoid Area	$A = \frac{(b_1 + b_2)}{2}h$	[math]A={\frac {(b_1+b_2)} 2} h[/math]

Some Higher Maths Codes

Combinations (alt 1)	${}^n\mathrm{C}_r$	[math]^n\mathrm{C}_r[/math]	^{n}\mathrm{C}_{r}
Combinations (alt 2)	${}_n\mathrm{C}_r$	[math]_n\mathrm{C}_r[/math]	_{n}\mathrm{C}_{r}
Permutations	${}_n\mathrm{P}_r$	[math]_n\mathrm{P}_r[/math]	_{n}\mathrm{P}_{r}
Binomial	$\binom{n}{r}$	[math]\binom{n}{r}[/math]	\binom{n}{r}
Limits	$\lim_{x \to 3} \frac{x^2 - 3x}{x - 3}$	[math]\lim_{x \to 3}\frac{x^2-3x}{x-3}[/math]	\lim_{x \to {m}} {Expression}
Infinity	∞	[math]\infty[/math]	\infty
Derivatives	$\frac{\mathrm{d}}{\mathrm{d}x}(x^3 + 2x) = 3x^2 + 2$	[math]\frac{\mathrm{d} }{\mathrm{d} x}(x^3 + 2x) = 3x^2 + 2[/math]	\frac{\mathrm{d} }{\mathrm{d} x} ({Function}) = {m} mathrm used to change font on d portion
Series Summation	$\sum_{i=0}^{n-1} i$	[math]\sum_{i=0}^{n-1} i[/math]	\sum_{StartingVar} = {StartingValue}^{EndingValue} {Expression}
Integration (alt 1)	$\int 2x\ dx = x^2 + C$	[math]\int 2x\ dx = x^2 + C[/math]	\int {n}\ dx = {Function} + C can use mathrm (above) to change font on d
Integration (alt 2)	$\int_{-2}^{5} x^2\ dx = \left[\frac{x^3}{3}\right]_{-2}^{5}$	[math]\int_{-2}^{5} x^2 \ dx = \left[\frac{x^3}{3}\right]_{-2}^5[/math]	\int_{LowerBound}^{UpperBound} {Expression1} \ dx = \left[{Function}\right] _{LowerBound}^{UpperBound} can use mathrm (above) to change font on d

Function with cases on intervals	$f(x) = \begin{cases} 1 & -1 \le x < 0 \\ \frac{1}{2} & x = 0 \\ 1 - x^2 & \text{otherwise} \end{cases}$	[math]f(x) =\begin{cases} 1 & -1 \le x < 0 \\ \frac{1}{2} & x = 0 \\ 1 - x^2 & \text{otherwise} \end{cases}[/math]	{FunctionName}(x) = \begin{cases} {Value1} & {Interval1}\\ {Value2} & {Interval2}\\ {Value3} & \text{otherwise} \end{cases}