Typing Math in Real Time on a Computer While Teaching

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Pretest

How long should it take to write this sentence on a computer?

Let $\phi(x) = \int_{\alpha}^{x} \frac{t^2}{\sqrt{x_0 + \sin^2(t)}} dt$ where $x_0, \alpha \in \mathcal{D} \subseteq \mathbb{R}$, then the fundamental theorem of calculus tells us that:

$$f'(x) = \frac{x^2}{\sqrt{x_0 + \sin^2(x)}}$$

A) 1 minute
B) 2 minutes
C) 3 minutes
D) 5 minutes
E) 10 minutes

When, Why, and How

- When
  - Writing proofs
  - Solving problems
  - Creating solutions to post
- Why
  - Verbatim PDF copy of notes on Blackboard (our LMS)
  - Saves time out of class
  - Saves time in class (sometimes)
  - Teaches students how to type math
- How
  - Microsoft Word (This Talk)
  - LaTeX

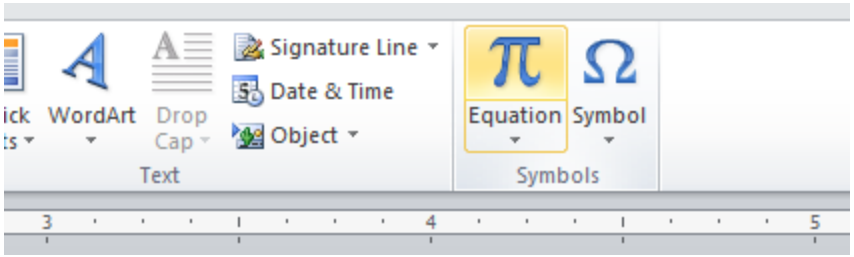
Pedagogy and Motivation

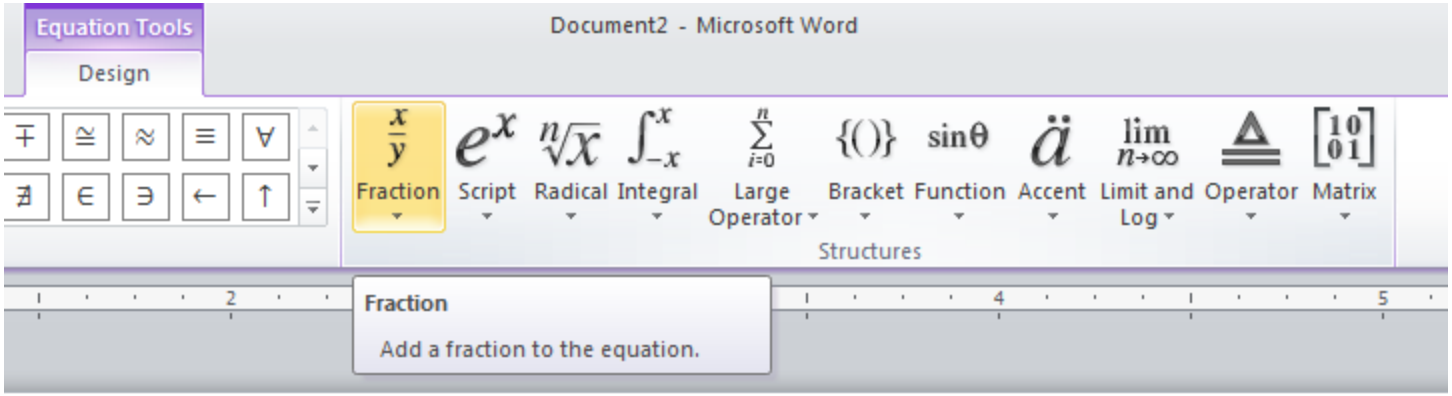
- Primary Motivation:
  - Precision in proofs
  - Incomplete student notes
- Secondary Motivation:
  - Time, time, time!
  - Readability
  - Transition into LaTeX

How – Word and LaTeX

- Equation Builder

  - Introduced to Word in 2007; PowerPoint in 2010.
  - NOT equation editor.
  - 100% keyboard input if you know the codes
    - (Many are taken from LaTeX, UTN28 describe it in more detail)
  - Point-and-click tools if you don't know the codes





How – Word and LaTeX

- The Equation Environment:
  - “inline” when on a line with text.
  - “display” when on its own line.
  - Most of the text features, such as font are disabled.
  - The math features, such as LaTeX symbols are enabled.
  - Keyboard shortcuts and symbol codes are important for speed.

Examples

- Example:

$$\int_0^1 x^2 dx$$

"\int_0^1 x^2 dx"

Examples

- Example:

$$x_2^3 + (4 + 7)^{5+8}$$

"x_2^3+(4+7)^(5+8)"

(This differs from LaTeX in the exponent: parenthesis instead of curly brackets)

Examples

- Example:

$$\binom{3}{2}$$

```
"(3\atop 2) "
```

Examples

- Example:

"7/8 "

(This differs from LaTeX because it renders the fraction bar and doesn't use \frac{}{})

Examples

- Example:

$$\sum_{n=1}^{\infty} \frac{1}{n^2} = \frac{\pi^2}{6}$$

```
"\sum_(n=1)^\infty 1/n^2 = \pi^2/6 "
```

Examples

- Example:

$$\alpha, \varepsilon, \delta \in \mathbb{R}$$

```
"\alpha,\varepsilon,\delta\in\doubleR "
```

($\mathbb{R}$ and the other blackboard bold, scripts, and fraktur characters differ from LaTeX)

Examples

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The End

Questions

or … Challenges???