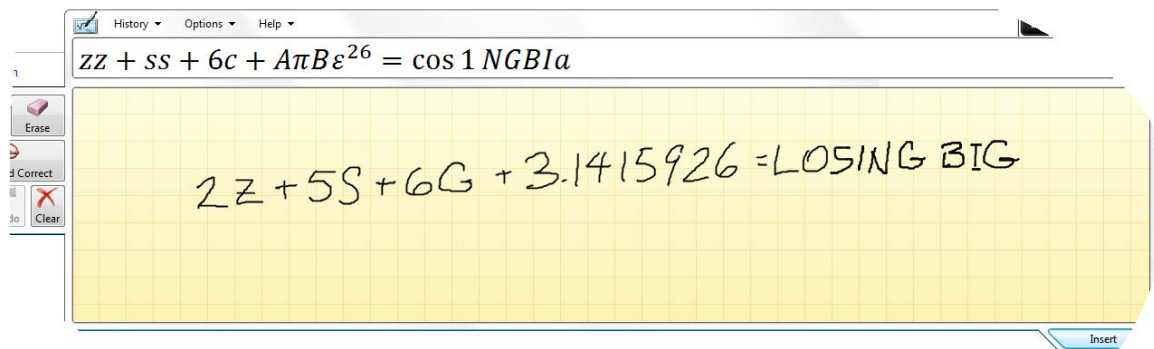Using the Math Input Panel on Windows 7.
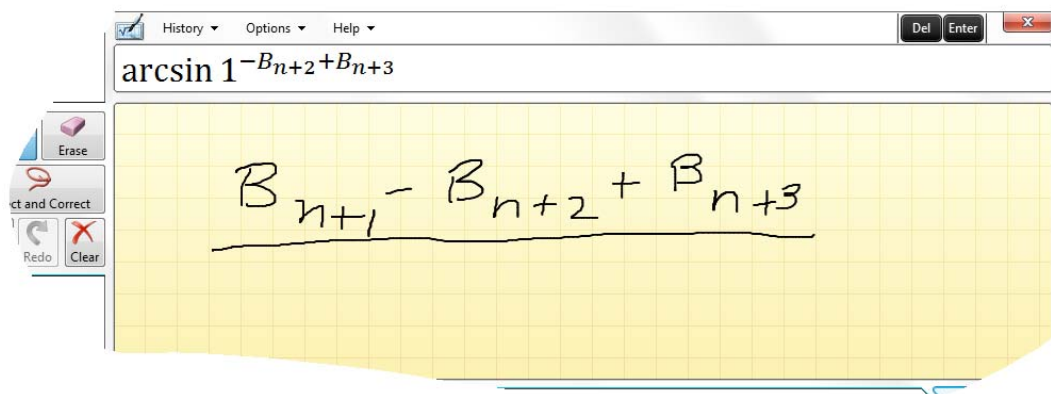
Richard Fateman March 11,2010

 Using an accessory graphics tablet (Wacom Cintiq). These are screen clips from interactions in which the "recognized result" is in the small panel in the upper left; the large panel with handwriting in it is my attempt to write some math. It is not particularly comfortable to write on a smooth hard plastic surface with a slippery pen, with feedback coming from a vertical display surface. (If we were writing on the same surface, as in a tablet PC, the experience would perhaps be slightly better. (The tablet PC also has a larger active surface than the Wacom tablet.)

Here is an example of stuff that I thought would confuse the math input panel, e.g. 2 vs z, 5 vs s and 6 vs G, but I was surprised by the inability of the math input panel to do numbers.

History ▾   Options ▾   Help ▾

$$zz + ss + 6c + A\pi B\varepsilon^{26} = \cos 1\, NGBIa$$

Erase
Correct
Clear

$$2z + 5S + 6G + 3.1415926 = LOSING\ BIG$$

Insert

The MIP apparently re-parses the whole expression; incomplete or unsyntactic input leads it astray. See what happens when we neglect to put something in the denominator, and then insert something:

History ▾   Options ▾   Help ▾   Del   Enter

$$\arcsin 1^{-B_{n+2}+B_{n+3}}$$

Erase
ct and Correct
Redo   Clear

$$B_{n+1} - B_{n+2} + B_{n+3}$$

Now put something in the denominator.

$$\frac{B_{n_\pi} - B_{n+2} + B_{n+3}}{\sqrt{pz + \varepsilon^2 + r^2}}$$

$$\frac{B_{n+1} - B_{n+2} + B_{n+3}}{\sqrt{p^2 + q^2 + r^2}}$$

One of my favorite examples is the ambiguity of $|<$ vs the letter K. See it here. Of course getting k vs K right is tough too.

$$tr\,ue = 1 < 2 + k_2 + k^{3+y^4}\frac{\eta}{2}$$

$$true = |<2 + K2 + K3 + y < \frac{y}{2}$$

To get this to come out right at all, we had to place the subscript on the T so that it was not below the bar of the T. It seems that certain letters, like capital T are prone to problems. For that matter, lower-case t looks rather like a + .

$$T_{nn}^{+T} - 1 = T_{n+1}$$

Write   Erase

Select and Correct

Undo   Redo   Clear

$$T_n + T_{n-1} = T_{n+1}$$

ned by the recurrence

Insert

$$I_i = 2x_{n-1}^T - T_{n-2}$$

$$n^T = 2x_{n-1}^T - T_{n-2}$$

Write   Erase

Select and Correct
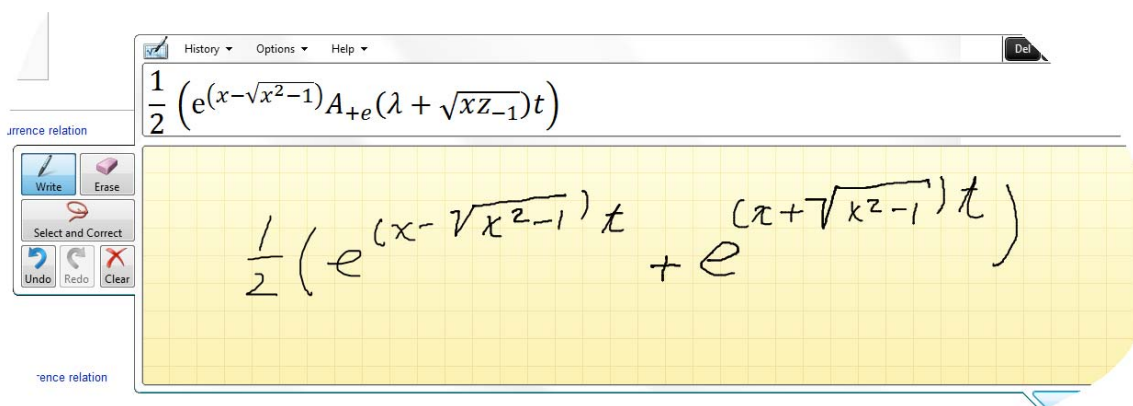
Undo   Redo   Clear

$$T_n = 2x T_{n-1} - T_{n-2}$$

Finally, an example in which everything works as we would like it to. Unfortunately, it required many erasures and corrections, and a fairly careful adherence to a base line. Separating "touching" symbols as the 2t below, may not be as hard as you might think, since there are temporal spaces too. There are separate ink objects or strokes.

History ▾ Options ▾ Help ▾ Del Enter

$$\sum_{n=0}^{\infty} T_n(x)t^n = \frac{1-tx}{1-2tx+t^2}$$

Erase
Correct
Clear
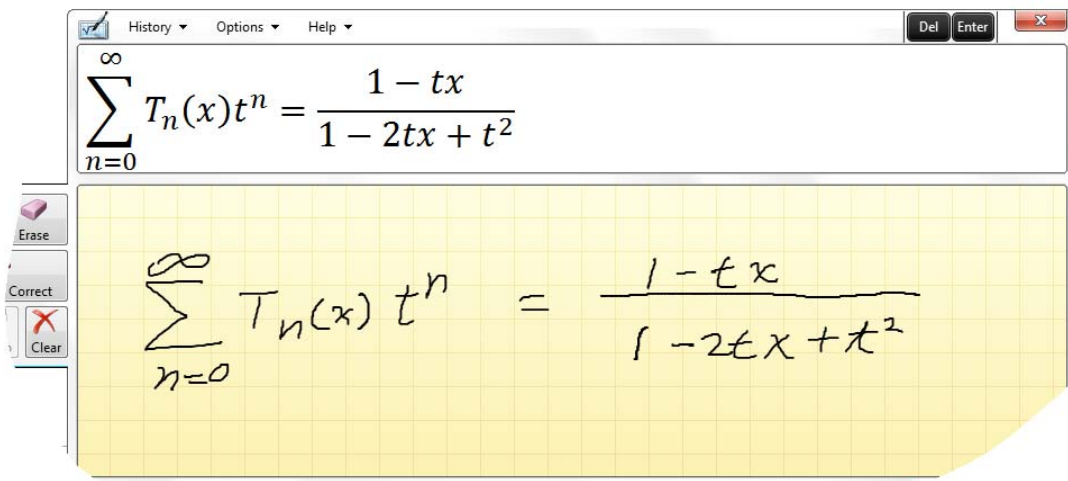
One of our first examples, and we could not get it to work better, even after many corrections.

History ▾ Options ▾ Help ▾ Del

$$\frac{1}{2}\left(e^{(x-\sqrt{x^2-1})}A_{+e}(\lambda + \sqrt{xz_{-1}})t\right)$$

urrence relation

Write Erase
Select and Correct
Undo Redo Clear

rence relation

Conclusion: you can provide neat demos with the MIP, and perhaps you can be trained to use it more effectively by careful choice of characters, neatness in drawing the characters, and knowing more about the available syntax. Yet it seems unlikely to be a good technology for entering math equations. The user interface for corrections is difficult to use. While there is a history mechanism to allow you to use previous expressions from the same scenario, there is no way of introducing expressions from other programs.
The output of the recognition is available as MathML, placed on the OS clipboard and so can be pasted in various programs such as Microsoft Word.