A table of derivatives and anti-derivatives

This example is based upon a nice example in the Pythontex gallery, see https://github.com/gpoore/pythontex/. It uses a tagged block to capture the Maple output for later use in the body of the LaTeX table.

```
1   # Create a list of functions to include in the table
2   funcs := [[sin(x),"\\\\"],          [cos(x),"\\\\"],          [tan(x),"\\\\"],
3            [arcsin(x),"\\\\[5pt]"], [arccos(x),"\\\\[5pt]"], [arctan(x),"\\\\[5pt]"],
4            [sinh(x),"\\\\"],          [cosh(x),"\\\\"],          [tanh(x)," "]]:
5
6   # mplBeg (CalculusTable)
7   for foo in funcs do
8       func := foo[1]:
9       eol  := foo[2]:
10      myddx := ''diff''(func,x):
11      myint := ''int''(func,x):
12      Print(cat(Latex(myddx),"&=",Latex(diff(func,x)),"\\quad & \\quad")):
13      Print(cat(Latex(myint),"&=",Latex(int(func,x)),eol)):
14  end do:
15  # mplEnd (CalculusTable)
```

```
\begin{align*}
    \mpl {CalculusTable}
\end{align*}
```

$$\frac{\mathrm{d}}{\mathrm{d}x}\sin(x) = \cos(x)$$

$$\frac{\mathrm{d}}{\mathrm{d}x}\cos(x) = -\sin(x)$$

$$\frac{\mathrm{d}}{\mathrm{d}x}\tan(x) = 1 + (\tan(x))^2$$

$$\frac{\mathrm{d}}{\mathrm{d}x}\arcsin(x) = \frac{1}{\sqrt{-x^2+1}}$$

$$\frac{\mathrm{d}}{\mathrm{d}x}\arccos(x) = -\frac{1}{\sqrt{-x^2+1}}$$

$$\frac{\mathrm{d}}{\mathrm{d}x}\arctan(x) = \left(x^2+1\right)^{-1}$$

$$\frac{\mathrm{d}}{\mathrm{d}x}\sinh(x) = \cosh(x)$$

$$\frac{\mathrm{d}}{\mathrm{d}x}\cosh(x) = \sinh(x)$$

$$\frac{\mathrm{d}}{\mathrm{d}x}\tanh(x) = 1 - (\tanh(x))^2$$

$$\int \sin(x)\,\mathrm{d}x = -\cos(x)$$

$$\int \cos(x)\,\mathrm{d}x = \sin(x)$$

$$\int \tan(x)\,\mathrm{d}x = -\ln(\cos(x))$$

$$\int \arcsin(x)\,\mathrm{d}x = x\arcsin(x) + \sqrt{-x^2+1}$$

$$\int \arccos(x)\,\mathrm{d}x = x\arccos(x) - \sqrt{-x^2+1}$$

$$\int \arctan(x)\,\mathrm{d}x = x\arctan(x) - \frac{1}{2}\ln\left(x^2+1\right)$$

$$\int \sinh(x)\,\mathrm{d}x = \cosh(x)$$

$$\int \cosh(x)\,\mathrm{d}x = \sinh(x)$$

$$\int \tanh(x)\,\mathrm{d}x = \ln(\cosh(x))$$