

Using \Input

This simple example shows how `\Input` can be used to include other LaTeX sources within the host source. Note the use of nested `\Input`'s. The merged file can be inspected by running

```
merge-tex.py -i example-10.tex -o merged.tex
```

from the command line. The merged file will be named `merged.tex`.

Source of example-10.tex

```
\Input{./example-10/limits/limits.tex}  
\Input{./example-10/calculus/calculus.tex}
```

Source of example-10/limits/limits.tex

```
\section*{Limits}  
  
\begin{python}  
    from sympy import *  
    a, n, x, dx = symbols('a n x dx')  
    ans = limit(sin(4*x)/x,x,0)           # py (ans.301,ans)  
    ans = limit(2**x/x,x,oo)              # py (ans.302,ans)  
    ans = limit(((x+dx)**2 - x**2)/dx, dx,0) # py (ans.303,ans)  
    ans = limit((4*n + 1)/(3*n - 1),n,oo)   # py (ans.304,ans)  
    ans = limit((1+(a/n))**n,n,oo)         # py (ans.305,ans)  
\end{python}  
  
\begin{align*}  
    &\backslashpy*{ans.301}\\  
    &\backslashpy*{ans.302}\\  
    &\backslashpy*{ans.303}\\  
    &\backslashpy*{ans.304}\\  
    &\backslashpy*{ans.305}  
\end{align*}
```

Source of example-10/calculus/calculus.tex

```
\Input{./example-10/calculus/derivs/derivs.tex}  
\Input{./example-10/calculus/integrals/integrals.tex}
```

Source of example-10/calculus/derivs/derivs.tex

```
\section*{Differentiation}  
  
\begin{python}  
    ans = diff(x*sin(x),x)                # py (ans.501,ans)  
    ans = diff(x*sin(x),x).subs(x,pi/4)    # py (ans.502,ans)  
\end{python}  
  
\begin{align*}  
    &\backslash\text{py}\{ans.501\}\backslash\backslash  
    &\backslash\text{py}\{ans.502\}  
\end{align*}
```

Source of example-10/calculus/integrals/integrals.tex

```
\section*{Integration}  
  
\begin{python}  
    a, b, x, y = symbols('a b x y')  
    ans = integrate(2*sin(x)**2, (x,a,b))    # py (ans.503,ans)  
    ans = Integral(2*exp(-x**2), (x,0,oo))    # py (lhs.504,ans)  
    ans = ans.doit()                        # py (ans.504,ans)  
    ans = Integral(Integral(x**2 + y**2, (y,0,x)), (x,0,1)) # py (lhs.505,ans)  
    ans = ans.doit()                        # py (ans.505,ans)  
\end{python}  
  
\begin{align*}  
    &\backslash\text{py}\{ans.503\}\backslash\backslash  
    &\backslash\text{py}\{lhs.504\}&=\backslash\text{Py}\{ans.504\}\backslash\backslash  
    &\backslash\text{py}\{lhs.505\}&=\backslash\text{Py}\{ans.505\}  
\end{align*}
```

Limits

```
from sympy import *
a, n, x, dx = symbols('a n x dx')
ans = limit(sin(4*x)/x,x,0)           # py (ans.301,ans)
ans = limit(2**x/x,x,oo)               # py (ans.302,ans)
ans = limit(((x+dx)**2 - x**2)/dx, dx,0) # py (ans.303,ans)
ans = limit((4*n + 1)/(3*n - 1),n,oo)   # py (ans.304,ans)
ans = limit((1+(a/n))**n,n,oo)          # py (ans.305,ans)
```

ans.301 := 4
ans.302 := ∞
ans.303 := $2x$
ans.304 := $\frac{4}{3}$
ans.305 := e^a

Differentiation

```
ans = diff(x*sin(x),x)                # py (ans.501,ans)
ans = diff(x*sin(x),x).subs(x,pi/4)   # py (ans.502,ans)
```

ans.501 := $x \cos(x) + \sin(x)$
ans.502 := $\frac{\sqrt{2}\pi}{8} + \frac{\sqrt{2}}{2}$

Integration

```
a, b, x, y = symbols('a b x y')
ans = integrate(2*sin(x)**2, (x,a,b))  # py (ans.503,ans)
ans = Integral(2*exp(-x**2), (x,0,oo)) # py (lhs.504,ans)
```

```

ans = ans.doit() # py (ans.504,ans)
ans = Integral(Integral(x**2 + y**2, (y,0,x)), (x,0,1)) # py (lhs.505,ans)
ans = ans.doit() # py (ans.505,ans)

```

$$\text{ans.503} := -a + b + \sin(a) \cos(a) - \sin(b) \cos(b)$$

$$\int_0^{\infty} 2e^{-x^2} dx = \sqrt{\pi}$$

(ans.504)

$$\int_0^1 \int_0^x (x^2 + y^2) dy dx = \frac{1}{3}$$

(ans.505)