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Jupyter-Math-For-Nerds / Jupiter-Files / MathWithSumpy_TRIGONOMETRY_082918.ipynb

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LeeSmithSBCC Added Trig

8a125a6 10 minutes ago

1 contributor

359 lines (358 sloc) 17.6 KB

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Just about any TRIG equation !!!

For TRIGONOMETRY: sympy library in Jupyter Notebook allows you to:

- Expand [Careful !]
- Expand_Trig
- Trig_Simp

```
In [6]: from sympy import *  
init_printing()
```

```
In [7]: x, y, z = symbols("x, y, z")
```

```
In [8]: a, b, c, d = symbols('a b c d')
```

```
In [9]: leeTrig = (x + x**2)/(x*sin(y)**2 + x*cos(y)**2)  
leeTrig
```

```
Out[9]: 
$$\frac{x^2 + x}{x \sin^2(y) + x \cos^2(y)}$$

```

```
In [10]: expandAlgebra = expand((x+1)**2)  
expandAlgebra
```

```
Out[10]:  $x^2 + 2x + 1$ 
```

```
In [18]: expandTrig = expand_trig((sin(2*x)))  
expandTrig
```

```
Out[18]:  $2\sin(x)\cos(x)$ 
```

```
In [19]: expandTrig2 = expand_trig((sin(4*x)))  
expandTrig2
```

```
Out[19]:  $-8\sin^3(x)\cos(x) + 4\sin(x)\cos(x)$ 
```

```
In [22]: expandTrig3 = expand_trig((sin(x+y)))  
expandTrig3
```

```
Out[22]:  $\sin(x)\cos(y) + \sin(y)\cos(x)$ 
```

```
In [24]: simplifyTrig4 = trigsimp(sin(x)**2 + cos(x)**2)  
simplifyTrig4
```

```
Out[24]: 1
```

```
In [20]: mixedTrig = (x + x**2)/(x*sin(y)**2 + x*cos(y)**2)  
mixedTrig
```

```
Out[20]: 
$$\frac{x^2 + x}{x \sin^2(y) + x \cos^2(y)}$$

```

$x\sin^2(y) + x\cos^2(y)$

```
In [25]: trigsimp = trigsimp((x + x**2)/(x*sin(y)**2 + x*cos(y)**2))  
trigsimp
```

Out[25]: $\frac{1}{x}(x^2 + x)$

```
In [28]: # Simplify Trig  
expandTrig5 = expand_trig(cos(3*x))  
expandTrig5
```

Out[28]: $4\cos^3(x) - 3\cos(x)$

```
In [35]: trigsimp2 = trigsimp(4 * cos(x)**3 - 3*cos(x))  
trigsimp2
```

Out[35]: $\cos(3x)$

