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]:
$$\frac{x^2 + x}{\quad}$$

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

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]: $\cos(3x)$