Trevor's Nifty *Mathematica* Cheat Sheet! (tip: to get text: apple + 7)

If you can't find what you want here and need help visit http://reference.wolfram.com/mathematica/guide/Mathematica.html
or email trevor.tomesh@uwrf.edu

Basic operations

```
2 + 2
```

```
4
```

```
3 - 2
```

```
1
```

```
4 / 2
```

```
2
```

```
4 * 2
```

```
8
```

derivatives / integrals:

```
D[2 x^2]
```

$$2\,x^2$$

```
Integrate[2 x^2, x]
```

$$\frac{2\,x^3}{3}$$

```
Integrate[2 x^2, {x, 1, 6}]
```

$$\frac{430}{3}$$

But I want a numeric answer!

```
N[Integrate[2 x^2, {x, 1, 6}]]
```

```
143.333
```

```
N[π, 100]
```

```
3.14159265358979323846264338327950288419716939937510582097494459230781640628620899862
 8034825342117068
```

(Tip: To π press escape pi escape)

Useful functions:

```
Expand[(2 x + 1) ^ 2]
```

$$1 + 4\,x + 4\,x^2$$

```
Factor[%]
```

$$(1 + 2\,x)^2$$

(Tip: % means "last output")

```
Solve[3 x == 5, x]
```

$$\left\{\left\{x \to \frac{5}{3}\right\}\right\}$$

You MUST use "==" in Solve[ ]

```
Sum[(1 / n ^ 4), {n, 1, ∞}]
```

$$\frac{\pi^4}{90}$$

```
N[%]
```

```
1.08232
```

(Tip: To get ∞ type escape inf escape)

```
Sin[π / 6]
```

$$\frac{1}{2}$$

```
Cos[π / 6]
```

$$\frac{\sqrt{3}}{2}$$

Assign values to a variable:

```
x = π / 6
```

$$\frac{\pi}{6}$$

```
Sin[x]
```

$$\frac{1}{2}$$

```
Cos[x]
```

$$\frac{\sqrt{3}}{2}$$

Roots:

```
Sqrt[5]
```

$$\sqrt{5}$$

```
5^2
```

```
25
```

Lists:

This is a list:

```
{1, 2, 3, 4, 5}
```

```
{1, 2, 3, 4, 5}
```

Assign list to a variable:

```
list = {1, 2, 3, 4, 5}
```

```
{1, 2, 3, 4, 5}
```

```
list
```

```
{1, 2, 3, 4, 5}
```

```
list * 5
```

```
{5, 10, 15, 20, 25}
```

```
π / list
```

$$\left\{\pi, \frac{\pi}{2}, \frac{\pi}{3}, \frac{\pi}{4}, \frac{\pi}{5}\right\}$$

```
N[Sin[list]]
```

```
{0.841471, 0.909297, 0.14112, -0.756802, -0.958924}
```

To clear variables:

```
Clear[x]
```

```
x
```

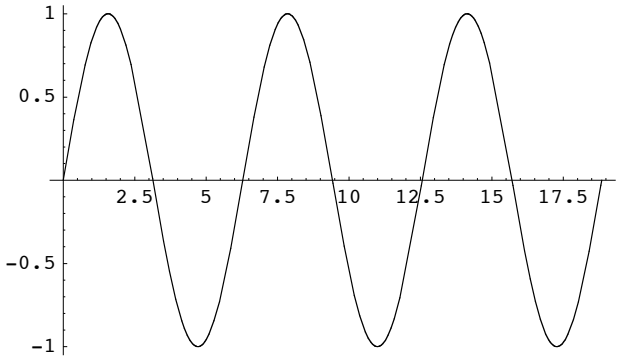
```
x
```

To Clear whole notebook:

```
Clear["`*"]
```

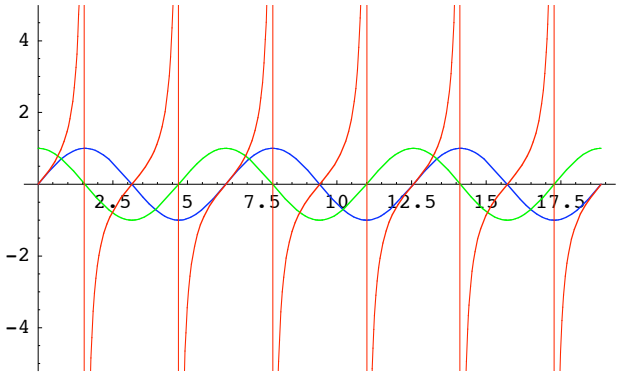
Plotting:

```
Plot[Sin[x], {x, 0, 6 π}]
```



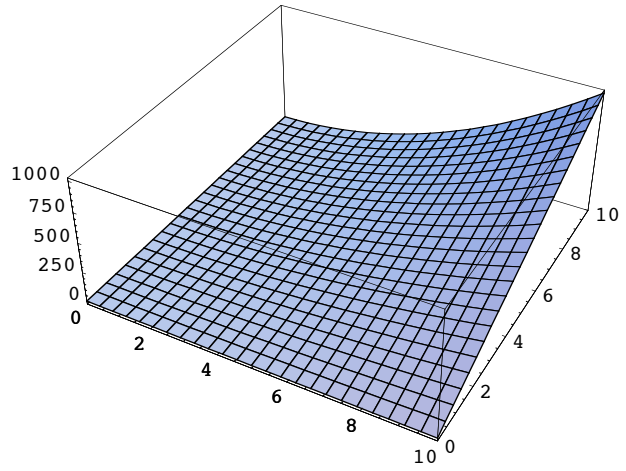

```
- Graphics -
```

```
Plot[{Sin[x], Cos[x], Tan[x]}, {x, 0, 6 π},
 PlotStyle → {RGBColor[0, 0, 1], RGBColor[0, 1, 0], RGBColor[1, 0, 0]}]
```




```
- Graphics -
```

```
Plot3D[x^2 * y, {x, 0, 10}, {y, 0, 10}]
```




```
- SurfaceGraphics -
```

Functions:

```
f[x_] := 3 x + 2
```

```
f[5]
```

```
17
```

```
f[2]
```

```
8
```

```
f[x_] := Factor[x]
```

```
f[2 x^2 + 3 x]
```

```
x (3 + 2 x)
```

Converting radians to degrees:

```
N[2 π / Degree]
```

```
360.
```

```
N[π / Degree]
```

```
180.
```

```
N[180 * Degree]
```

```
3.14159
```