Formules de trigonométrie - Cheat sheet

Lycée MASSÉNA, MPSI 832 *2011-2012*

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\begin{aligned}
\cos(a+b) &= \cos a\cos b - \sin a\sin b \\
\sin(a+b) &= \cos a\sin b + \sin a\cos b \\
\cos(a-b) &= \cos a\cos b + \sin a\sin b \\
\sin(a-b) &= \sin a\cos b - \sin b\cos a \\
\cos a\cos b &= \frac{1}{2}(\cos(a+b)+\cos(a-b)) \\
\sin a\sin b &= \frac{1}{2}(\cos(a-b)-\cos(a+b)) \\
\sin a\cos b &= \frac{1}{2}(\sin(a+b)+\sin(a-b)) \\
\cos p+\cos q &= 2\cos\left(\frac{p+q}{2}\right)\cos\left(\frac{p-q}{2}\right) \\
\cos p-\cos q &= -2\sin\left(\frac{p+q}{2}\right)\sin\left(\frac{p-q}{2}\right) \\
\sin p+\sin q &= 2\sin\left(\frac{p+q}{s}\right)\cos\left(\frac{p-q}{2}\right) \\
\sin p-\sin q &= 2\sin\left(\frac{p-q}{2}\right)\cos\left(\frac{p+q}{2}\right) \\
\cos(2\,a) &= \cos^2 a-\sin^2 a = 2\cos^2 a-1 = 1-2\sin^2 a \\
\sin(2\,a) &= 2\sin a\cos a \\
\tan(a+b) &= \frac{\tan a+\tan b}{1-\tan a\tan b} \\
\tan(a-b) &= \frac{\tan a-\tan b}{1+\tan a\tan b} \\
\tan(2\,a) &= \frac{2\tan a}{1-\tan^2 a} \\
1+\tan^2 x &= \frac{1}{\cos^2 x} = \tan'(x) \\
\cos\theta &= \frac{e^{i\theta}+e^{-i\theta}}{2} \\
\sin\theta &= \frac{e^{i\theta}-e^{-i\theta}}{2\,i} \\
(\cos\theta+i\sin\theta)^n &= \cos n\,\theta+i\sin n\,\theta
\end{aligned}
$$

En posant $t=\tan\frac{x}{2}$:

$$
\begin{aligned}
\sin x &= \frac{2\,t}{1+t^2} \\
\cos x &= \frac{1-t^2}{1+t^2} \\
\tan x &= \frac{2\,t}{1-t^2}
\end{aligned}
$$