Table of Formulas

1) $\sin(2x) = 2\sin(x)\cos(x)$

2) $\cos^2(x) = \dfrac{1}{2}(1 + \cos(2x))$

3) $\sin^2(x) = \dfrac{1}{2}(1 - \cos(2x))$

4) $\displaystyle\int \sec(x)\ dx = \ln|\sec(x) + \tan(x)| + C$

5) $\displaystyle\int \sec^3(x)\ dx = \frac{1}{2}\sec(x)\tan(x) + \frac{1}{2}\ln|\sec(x) + \tan(x)| + C$

6) $\displaystyle\int \frac{1}{1+x^2}\ dx = \arctan(x) + C$

7) The Taylor series centered at a for the function $f(x)$ is given by

$$T(x) = \sum_{n=0}^{\infty} \frac{1}{n!} f^{(n)}(a)(x-a)^n.$$

If $|f^{(n+1)}(x)| \leq M$ for all $|x-a| \leq d$, then the nth remainder term satisfies $|R_n(x)| \leq \dfrac{1}{(n+1)!}M|x-a|^{n+1}$ for all $|x-a| \leq d$.

8) $e^x = \displaystyle\sum_{n=0}^{\infty} \frac{1}{n!}x^n$; converges for all x.

9) $\cos(x) = \displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n}{(2n)!}x^{2n}$; converges for all x.

10) $\sin(x) = \displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)!}x^{2n+1}$; converges for all x.

11) $(1+x)^r = 1 + \displaystyle\sum_{n=1}^{\infty} \frac{r(r-1)(r-2)\cdots(r-n+1)}{n!}x^n$; converges for $|x| < 1$.