MAT 121 - Cálculo II - IOUSP
2º semestre de 2014
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TABELA TRIGONOMÉTRICA

1. $\cos(\alpha+\beta) = \cos\alpha\cos\beta - \text{sen}\alpha\text{sen}\beta$

2. $\text{sen}(\alpha+\beta) = \text{sen}\alpha\cos\beta + \text{sen}\beta\cos\alpha$

3. $\text{tg}(\alpha+\beta) = \frac{\text{tg}\alpha + \text{tg}\beta}{1 - \text{tg}\alpha\text{tg}\beta}$

4. $\sec^2\theta = 1 + \text{tg}^2\theta$

5. $\text{cossec}^2\theta = 1 + \text{cotg}^2\theta$

6. $\cos 2\theta = \cos^2\theta - \text{sen}^2\theta$

7. $\text{sen}2\theta = 2\text{sen}\theta\cos\theta$

8. $\cos^2\theta = \frac{1}{2} + \frac{1}{2}\cos 2\theta$

9. $\text{sen}^2\theta = \frac{1}{2} - \frac{1}{2}\cos 2\theta$

10. $\text{sen}\theta = \frac{2\text{tg}\frac{\theta}{2}}{1 + \text{tg}^2\frac{\theta}{2}}$, se $\cos\frac{\theta}{2} \neq 0$

11. $\cos\theta = \frac{1 - \text{tg}^2\frac{\theta}{2}}{1 + \text{tg}^2\frac{\theta}{2}}$, se $\cos\frac{\theta}{2} \neq 0$

12. Fórmulas de prostaférese (transformam produto em adição ou subtração):
    (a) $\text{sen}\alpha\cos\beta = \frac{1}{2}[\ \text{sen}(\alpha+\beta) + \text{sen}(\alpha-\beta)\ ]$
    (b) $\cos\alpha\cos\beta = \frac{1}{2}[\ \cos(\alpha+\beta) + \cos(\alpha-\beta)\ ]$
    (c) $\text{sen}\alpha\text{sen}\beta = \frac{1}{2}[\ \cos(\alpha-\beta) - \cos(\alpha+\beta)\ ]$

13. $\text{sen}p - \text{sen}q = 2\text{sen}(\frac{p-q}{2})\cos(\frac{p+q}{2})$

14. $\cos p - \cos q = -2\text{sen}(\frac{p+q}{2})\text{sen}(\frac{p-q}{2})$

15. $\cos^2\theta = \frac{1}{2}(1 + \frac{\text{cotg}\,2\theta}{\sqrt{1+\text{cotg}^2\,2\theta}})$.

TABELA DE DERIVADAS

1. $f(x) = x^n \implies f'(x) = nx^{n-1}\,,\ \forall x \in \mathbb{R}\,,\ \forall n \in \mathbb{N}$
2. $f(x) = x^\alpha \implies f'(x) = \alpha x^{\alpha-1}\,,\ \forall x > 0\,,\ \forall \alpha \in \mathbb{R}$
3. $\sin' x = \cos x$
4. $\cos' x = -\mathrm{sen}\, x$
5. $\tan' x = \sec^2 x$
6. $\sec' x = \sec x\, \mathrm{tg\,x}$
7. $\mathrm{cotg}' x = -\,\mathrm{cossec}^2\, x$
8. $\mathrm{cossec}' x = -\,\mathrm{cossec}\, x \cot x$
9. $f(x) = e^x \implies f'(x) = e^x$
10. $\ln' x = \frac{1}{x}\,, \forall x > 0$
11. $\arctan' x = \frac{1}{1+x^2}$
12. $\mathrm{arcsen}' x = \frac{1}{\sqrt{1-x^2}}\,,\ x \in (-1, +1)$
13. $\sinh' x = -\cosh x$
14. $\cosh' x = \sinh x.$

Regras de Derivação

1. $(f+g)' = f' + g'$
2. $(cf)' = cf'$, se c é uma constante
3. $(fg)' = f'g + fg'$
4. $\left(\frac{f}{g}\right)' = \frac{f'g - fg'}{g^2}$
5. $(f \circ g)'(p) = f'(g(p)) \cdot g'(p)$ (Regra da Cadeia).

Fórmulas Úteis de Derivação

1. $[e^{f(x)}]' = e^{f(x)} f'(x)$
2. $[\ln f(x)]' = \frac{f'(x)}{f(x)}$
3. $[f(x)^\alpha]' = \alpha f(x)^{\alpha-1} f'(x)$

5. $[a^x]' = a^x \ln a$, $a > 0$ e $a \neq 1$

4. $[f(x)^{g(x)}]' = f(x)^{g(x)}[g(x) \ln f(x)]'.$