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Fundamentos da Matemática II

15 de Abril de 2018

- (1) Simplifique as seguintes expressões:
 - (a) $\cos(2x)$
 - (b) $\operatorname{sen}\left(\frac{\pi}{2} + x\right)$
 - (c) sen $\left(\frac{3\pi}{2} x\right)$
 - (d) $\frac{\sin(2\pi x) \cdot \cos(\pi x)}{\operatorname{tg}\left(\frac{\pi}{2} + x\right) \cdot \cot\left(\frac{3\pi}{2} x\right)}$
- (2) Prove que $(1 + \cot^2 x)(1 \cos^2 x) = 1$, para todo x real, $x \neq \pi$.
- (3) Demonstre as identidades seguintes:

(a)
$$\frac{\sin x}{\cos \sec x} + \frac{\cos x}{\sec x} = 1$$

(b)
$$tgx + cotgx = sec x \cdot cossecx$$

(c)
$$\frac{\cot^2 x}{1 + \cot^2 x} = \cos^2 x$$

Gabarito

(1) (a)
$$\cos(2x) = \cos^2 x - \sin^2 x$$

(b)
$$\operatorname{sen}\left(\frac{\pi}{2} + x\right) = \cos x$$

(c)
$$\operatorname{sen}\left(\frac{3\pi}{2} - x\right) = -\cos x$$

(d)
$$\frac{\operatorname{sen}(2\pi - x) \cdot \operatorname{cos}(\pi - x)}{\operatorname{tg}\left(\frac{\pi}{2} + x\right) \cdot \operatorname{cotg}\left(\frac{3\pi}{2} - x\right)} = -\operatorname{sen} x \cdot \operatorname{cos} x$$